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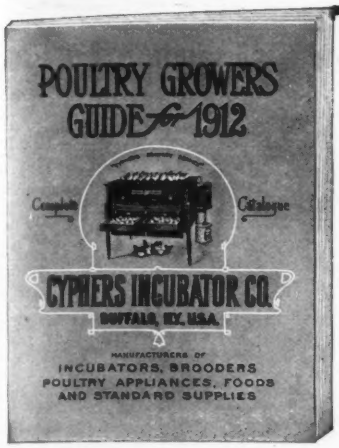

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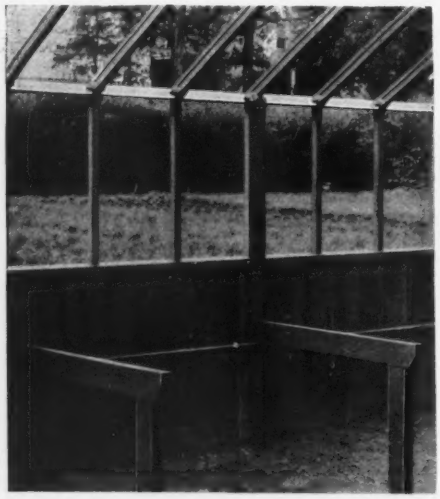

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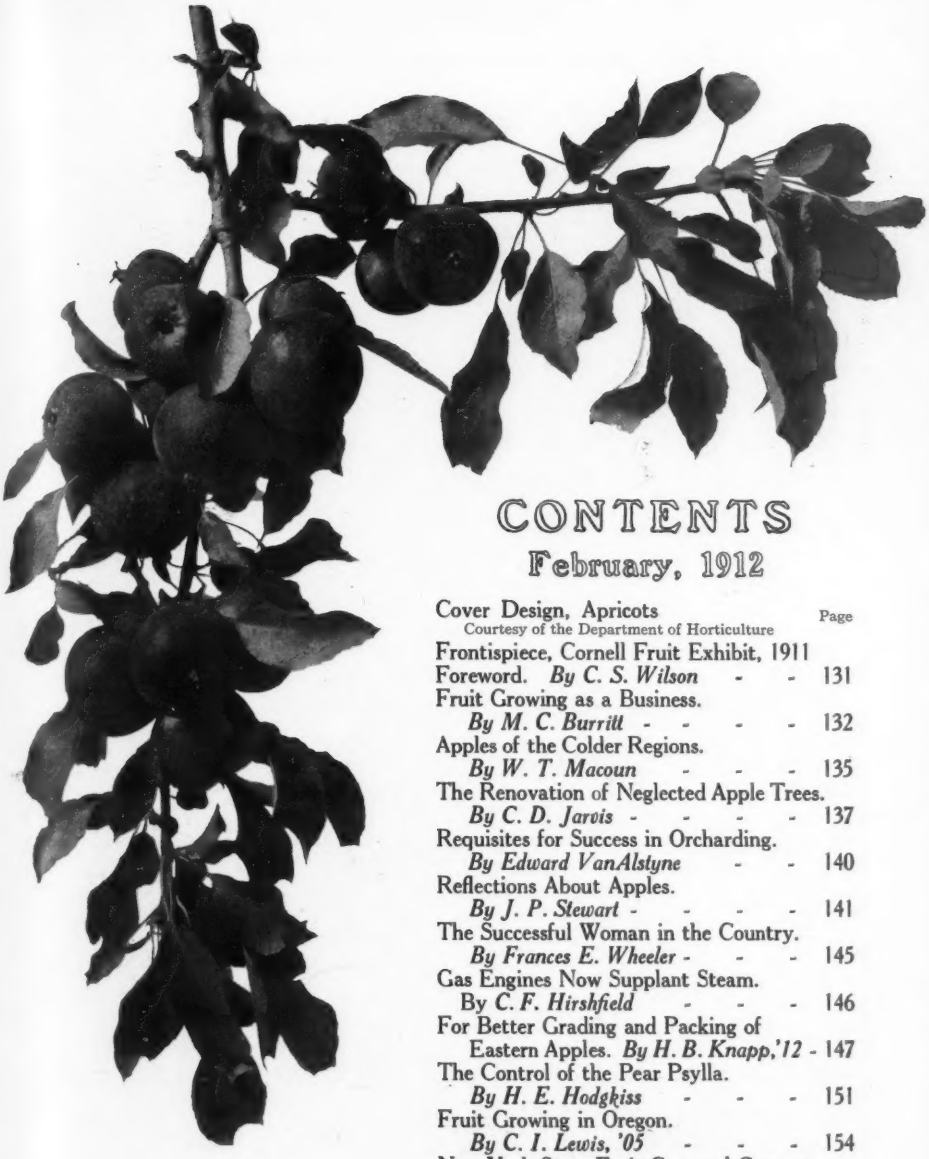

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CORNELL FRUIT EXHIBIT, 1911.

(Note how the labels are subdued, so that when viewing the exhibit as a whole only the fruit is visible.)

The Cornell Countryman

Vol. 9 FEBRUARY, 1912 No. 5

FOREWORD

By C. S. Wilson

Professor of Pomology at Cornell University

AS AN industry and science, fruit-growing has made rapid progress in recent years. Not so long ago a farm devoted to fruit-growing as its main industry was rare, whereas today there are hundreds of such farms. Until very recently the work of fruit-growing in our Experiment Stations and Colleges has been carried on in connection with vegetables, flowers, and landscape gardening. The work has gradually differentiated until at the present time fruit is considered of sufficient importance to receive the recognition of a separate department.

Although the apple has been grown by the settlers since the early history of our country, commercial orcharding did not begin until the first quarter of the eighteenth century. The apple as we know it was brought to this country by the settlers, the only native species being the wild crab.

The settlers brought with them the seeds of the apple which they planted in the clearings around their primitive homes. The fruit, which of course was inferior in quality, was eaten by the members of the family or made into cider. As the settlers moved westward they carried with them the fruit of their primitive homes, and thus the apple moved westward with the tide of emigration. Seeds of the fruit also fell into the hands of the Indians and by them were carried far inland in advance of the settlers. So rapid was its spread that in 1779, when Sullivan invaded Central New York, he found Indian orchards regularly laid out and producing an abundance of fruit.

Many of our varieties have developed as seedlings from these old orchards. Grafting was early introduced, and whenever a promising fruit was noticed it was quickly disseminated. In this manner have come to us the Baldwin, Rhode Island, Tompkins King, Rome, Hubbardston, Jonathan, Yellow Newtown, Winesap, and many others.

Methods of management have progressed with development of the industry. The settlers planted the fruits about their homes, where, naturally, the trees stood in sod. When the industry became commercialized it seemed to carry over with it the idea that the fruit tree should grow in sod, and that the ground beneath it could be utilized for other crops—an idea which is hard to eradicate. It is generally recognized now that clean culture is best for the fruit.

The fruit farms, which are well cared for, are producing excellent returns. A study of thirty-one such farms by the Department of Farm Practice showed an average net profit on the money invested of about twenty per cent. It is conservative to say that orchards well cared for are netting one hundred to two hundred dollars per acre in New York State. There are many orchards which are netting even more than this amount, and some, in the case of individual years, as high as ten to twelve hundred dollars per acre. Fruit-growing is one of the most promising industries in the East at the present time.

FRUIT GROWING AS A BUSINESS

By M. C. Burritt, M. S. A., '10

Editor of *The New York Tribune Farmer*

TWO factors have always operated to deter many persons from taking up fruit growing as a business and probably will continue to do so for some time to come. These are the comparatively large investment required and the necessarily long waiting period before paying returns can be obtained. Farmers who have not gone into the business of fruit growing because they could not afford this heavy investment or to wait so long for returns have been very wise. Others lacking the necessary capital who have planted heavily have learned to their sorrow the importance of capital in the business both for the original investment and to carry the enterprise.

A German writer, A. Jansen, writing in Fühling's *Landvirtschaftliche Zeitung* for February, 1910, on "Die Geldfrage beim Obstbaum" (The Cost of an Orchard), has so well stated the proposition that I venture to quote from his article somewhat at length.

"The greatest mistake made by those starting an orchard lies in the fact that few make a correct estimate of the money needed. It is not only the cost of the trees and the cost of the tools, but above all it is the many years of waiting that make such strong inroads upon the capital."

"The burden begins with the setting out of the trees and lasts from 5 to 15 years depending upon the varieties planted. During this time the trees are an expense without giving any profit. In the technical sense one reckons that the burden is relieved from that time when regular net profit is obtained. As I further wish to show, the tree needs a good capital during this waiting period on which interest must of course be paid."

A VIEW IN AN 8-YEAR OLD ORCHARD WITH DUTCHESS OF OLDENBURG IN FOREGROUND.

ONE OF THE BALDWIN TREES IN OUR 36-YEAR OLD ORCHARD.
NOTE THE LARGE BEARING SURFACE.

"On account of the irregular harvests there is need of a reserve capital which will tide over two or three bad years. The many who have taken up fruit culture and who have only calculated upon the expense of setting out the orchard, find that after a few years they are unable to meet the increasing expenses. They have to economize and that usually begins at the wrong end, namely, the cultivation of the soil and the combating of diseases and insects. The condition of the orchard goes backward and naturally the anticipated harvest is prolonged."

Investigations made by the writer in 1906 and 1907 under the direction of Professor Warren, which were published in Cornell Bulletin 271, give some indication of the larger capitalization necessary on fruit farms. The 31 fruit farms on which data was secured although they probably did not have to exceed 20 or 25 per cent of their total area in fruit, showed an average total capitalization of $128.95 per acre as compared with $84.53 per acre for general farms and $67.65 per acre on dairy farms. The capital included real estate, machinery and tools, horses, other stock, etc. On fruit farms real estate averaged 84 per cent. of the total capital as compared with 79 per cent. on general farms and 70 per cent. on dairy farms. The average working capital on fruit farms was $21 an acre as compared with $18 an acre for general farms and $20 an acre for dairy farms. On farms entirely devoted to fruit or nearly so, the capital is proportionately still higher.

For several years we have kept rather careful records at "Beechwood Farm," in Monroe County, New York, where we have some twenty acres of non-productive growing orchards. The records have been made in coöperation with the Office of Farm Management of the U. S. Department of Agriculture. While they are not in any way an average, being for one farm only and under its own special conditions, yet they are most interesting because of the general light they throw upon the whole subject.

In a summary of the first eight years of the life of a 6.6 acre apple orchard on this farm, filled one way with plums (a total of about 70 trees per acre), Mr. E. H. Thomson found in tabulating the figures that we had invested in the orchard at the end of the period $124.27 an acre, not counting the value of the land itself (except as we reckoned the interest upon it) or the income lost from other crops which might have been grown had the orchard not been in the way. This involved a total outlay of $35.09 for labor and $89.19 as a cash expense on each acre. In another apple orchard of five acres set 36 by 40 feet with peach trees between the apple trees both ways, we had invested $72.10 an acre at the end of four years, which amounted to nearly 72 cents per tree and $2.86 for each apple tree, about 72 cents a year.

In both these cases only a very small income has as yet been obtained from the trees themselves. They have constituted a cumulative expense which the farm has had to carry. In order to help meet the expense of growing these orchards to profitable bearing one can, of course, resort to interplanting and intercropping. We did both, using plums and peaches for the "fillers" and principally beans as the crop. Although both these means have materially reduced the cost, they have not as yet overcome it entirely. It has been our experience that neither "fillers" nor field crops yield quite as much as can theoretically be expected of them, with a very few exceptions. In the eight year old orchard we were able to produce a sufficient amount to reduce the cost from $124.27 to $44.55 net per acre. In the four year old orchard the net cost to date is only $9.47 per acre, or 37½ cents a tree, which is not a bad showing. This orchard is likely to clear itself in its fifth year.

The growing of tree fruits, particularly apples, might be called extensive fruit growing as compared with small fruit culture. The more trees or vines one puts upon an acre the larger will be the investment required not only to plant it in the first place but to develop it. It is true that the income may also be larger but the point here is simply that a larger investment is essential in obtaining any income. One must have capital. The period of waiting for returns is, however, considerably reduced with small fruits.

Not only is the investment required to develop an orchard large, but the capital necessary to carry on the ordinary operations and handle the crop likewise amounts to a considerable sum. Our figures at Beechwood farm show that a barrel of apples costs from $1.00 to $1.73 according to the crop, and averages $1.08. This amounts to from $60 to $100 an acre or an average of $75.60 per acre with an annual yield of 70 barrels per acre.

As a business in which to engage when one has plenty of capital, fruit growing is most attractive. It requires constant and intelligent attention for at least eight months in the year, but leaves the other four months open for other enterprises or a vacation. The careful intensive culture required and the constant combat with insects and diseases, keep one alert and active if he would succeed, and demand energy and intelligence above the average. The mental stimulus of this active and exacting business supplies something which some persons find to be lacking in certain types of farming. Because eternal vigilance and quick action in emergencies are the price of success many men will choose the business of fruit growing, and for the same reasons others will keep out of it. To an active well trained young man, with a love for outdoor life, fruit growing offers opportunity not only to gratify his taste but also to do so with profit.

APPLES OF THE COLDER REGIONS OF THE UNITED STATES AND CANADA

By W. T. Macoun

Dominion Horticulturist

THE apples grown in the colder parts of Canada and the United States come mainly from two sources, namely, Russia and the colder parts of the United States and Canada. The varieties originated in Russia are the survivors of many thousands of seedlings which must have originated in that country since its settlement and are probably the hardiest apples of marketable size which exist today. The apples originated in the colder parts of the United States and Canada are likewise the survivors of many seedlings which have grown up since America was settled. The fact that a variety of apple originates in a cold climate does not necessarily make it hardy. It must be able to withstand the severe winters, spring frosts, and summer heat to be hardy. Some of the hardiest apples from the standpoint of winter injury are not suitable for a hot, dry climate, nor for warm climates subject to spring frosts. It is the spring and summer in such cases, not the winter, which determine the suitability of a variety. Many a variety which would have been an acquisition in the North has, no doubt, originated in the South, but not succeeding there, it has never come into prominence. Once a variety has originated which is hardy in the colder parts we may expect the seedlings from it, or the crosses resulting from it and some other variety, to be hardy. If it is crossed with a Siberian crab apple, then at least some of the progeny are likely to be still hardier than the more tender parent. The Russian apples have many of them, doubtless, some blood of the Siberian crab (Pyrus baccata).

The Russian apples, or apples which have sprung from Russian varieties, which are most grown in the colder regions are:

Summer:—Yellow Transparent, Lowland Raspberry, Red Astrachan, Montreal Strawberry, Oldenburg, Charlamoff.

Autumn:—Peach of Montreal, Antonovka, McMahan, Dudley, Patten, Wealthy, Alexander, Hibernal.

Winter:—Wolf River, Milwaukee, Pewaukee.

It will be noticed that of this list only three are winter apples, namely, Wolf River, Milwaukee, and Pewaukee. The former of these is a seedling of Alexander, and the two latter are seedlings of Oldenburg, both Russian sorts. Of the rest, which are not pure Russian, the Montreal Strawberry and Peach of Montreal have marked Russian characteristics. Their origin is uncertain and they may be pure Russian. McMahan is a seedling of Alexander, a Russian variety; Dudley is a seedling of Oldenburg; Patten is a seedling of Oldenburg; Wealthy is said to have come from the Cherry crab; Wolf River is a seedling of Alexander, and Milwaukee is a seedling of Oldenburg; Pewaukee is a seedling of Oldenburg. It will thus be seen that practically all of these varieties owe their hardiness to either being pure Russian or to being seedlings of Russian apples.

Of the varieties evidently not from Russian stock, at least in the first generation, are:

Summer:—None.

Autumn:—St. Lawrence, Langford Beauty.

Early Winter:—McIntosh, Fameuse.

Winter:—Baxter, Roseau (Canada Red of Ontario), Blue Pearmain, Bethel, Canada Baldwin, Bullock (American Golden Russet), Northwestern *Greening*, Malinda, Scott Winter.

No hardy summer apples of American ancestry have so far come to the front, though some excellent sorts originated at the Central Experimental Farm, Ottawa, Canada, will soon be

available. The Russian varieties have been so early and such heavy bearers that so far they have taken the lead. The St. Lawrence and Langford Beauty apples are of Canadian origin, and both have marked Fameuse characteristics and must be closely related to it. McIntosh is, undoubtedly, a seedling of Fameuse, and Fameuse itself has shown its hardiness by having existed in the colder parts of Canada for probably 250 years. Some of its seedlings, the McIntosh for instance, are hardier than the parent. Of the winter apples, Canada Baldwin is a seedling of Fameuse. Baxter, Roseau, Bethel, and Blue Pearmain are evidently closely related and may be placed in one group. The three former may be all seedlings of the last, as they are much alike. They all originated in the colder regions: Baxter in Eastern Ontario, Bethel in Vermont, and Roseau and Blue Pearmain of unknown origin. To this group could be also added the Stone apple, a Vermont seedling, not much grown but one of the hardiest winter sorts. Northwestern *Greening* originated in Wisconsin of unknown parents; Malinda in Vermont, also Scott Winter in Vermont. The only apple of all the varieties mentioned which has not been originated in what might be called a cold climate is the Bullock (American Golden Russet), which is thought to have originated in New Jersey, but this is doubtful.

What conclusions must we draw, then, from this list of varieties for the colder regions? Is it merely that certain varieties are adapted to certain climates, or is it that the climate first eliminated the unadapted? When we have decided this question we can select from the progeny of the adapted, or survivors, those which come nearest our ideal for commercial or domestic purposes.

With the excellent material we have to work with in hardy apples of the Fameuse type the writer can in his mind's eye see varieties with all the good qualities of the McIntosh covering the season from early summer to late winter, and it may be said that apples much resembling McIntosh have already been originated at the Central Experimental Farm, Ottawa, covering most of that period.

The northern limit of successful apple culture in America is not yet known, nor is it likely to be for many years, as severer climatic conditions have to be met, understood, and conquered before success is assured, and this takes time. In the past and in the present, apple culture has advanced northward with civilization, and it is likely to do so in the future. It is not a rash statement to make, considering how far north is the limit of apple culture in Russia, that apples will be grown successfully inland in America as far north as latitude 60°, and that considerably before the end of the present century. What has happened in the past thirty years? Minnesota and Wisconsin have demonstrated that apple growing can be carried on successfully and extensively in those States. In Southern Manitoba quite a number of the hardiest varieties are doing well and yielding profitable crops, and Oldenburg apples have matured in latitude 50° in Manitoba. The northern limit of the Wild Siberian crab (Pyrus baccata) has not yet been determined, and hybrids between this fruit and the apple seem to equal it in hardiness. Fruit of one of these was produced on the Dominion Experimental Station at Fort Vermilion, Alta., latitude 58°, in 1910.

The apple growers of the North will be greater thinkers than those of the South, as greater difficulties will have to be overcome, special methods of pruning and culture adopted, and new varieties produced which will resist the dry and cold winds.

In the province of Quebec apples are grown as far north as latitude 48°, and perhaps further, and in Ontario the culture of this fruit is advancing almost as rapidly as settlement, or as soon as the new conditions are understood. The great commercial orchards, however, do not yet extend

much above latitudes 42° and 45°, from below the City of Quebec, southward through Vermont, and westward to the Great Lakes there is an immense tract of country in which there is enough land suitable for apple growing to produce all of this fruit that would be required to supply the world for many years to come. The capabilities of Nova Scotia to produce fine apples is well known and it has been demonstrated that Prince Edward Island and large areas in New Brunswick can produce fruit of the best quality. The development of apple culture in British Columbia is also working northward. Our friends in the South and West must look to their laurels. In the north, the best wheat is produced and the best cheese and butter, and when the time comes, which in my judgment is not far distant, when apples are as plentiful and deemed as necessary and as high a standard is demanded as for flour, honey, cheese, and butter the North will be able to supply both this world and the old world with fruit of the highest color and best quality.

THE RENOVATION OF NEGLECTED APPLE TREES

By Dr. C. D. Jarvis
Connecticut Agricultural College

THE farmers in the northeastern part of the country have suddenly come to realize that the old apple orchard, which in the past has been regarded as a side issue, has great possibilities and that in spite of neglect it is one of the most profitable features of the whole farm system. There has been an attempt, therefore, during the past few years to improve the old orchards and the work of renovation has been an interesting and profitable undertaking. In the following paragraphs I shall not attempt to outline the whole process but to merely call attention to some of the most striking features in connection with the work.

Probably the most conspicuous example of successful renovation is that of Mr. George A. Drew, of Conyers Farm, Greenwich, Conn. Mr. Drew has worked on several orchards varying in age from twenty-five to sixty years. The orchards were very seriously infested with scale and some of the trees were so far gone that the workman on the place inquired of their optimistic employer whether he expected "to bring the dead back to life." One Baldwin orchard in the fourth year after work was commenced, produced an average yield of nine barrels per tree. On the whole, Mr. Drew adopted rational methods of pruning, although in some cases where the trees were especially high-headed and where the trees had become very much weakened, the treatment was quite severe. In some cases the height of the tree was reduced by twenty or thirty feet.

Opinions differ considerably with regard to the details of the work, but there are certain general rules that are usually followed. The primary object in the whole work is to form a new head on the old stump. Some trees are well supplied with water-sprouts from which to develop the new head. If no watersprouts are present their growth must be encouraged and this is best done by severe heading-in.

A common method consists in heading-in some of the branches during one season and treating the remainder in the same way the following year, or even later (see fig. 1). The advocates of this method claim that it lessens the "shock" to the tree and that the tree may continue to bear fruit. In some cases it may be advisable to follow this method but it is probable that trees requiring such severe treatment will stand to have the whole top removed in one season.

1. IF ONE OR MORE OF THE MAIN BRANCHES ARE LEFT TILL THE SECOND OR THIRD SEASON THE "SHOCK" IS NOT SO GREAT.

A second method, and probably the most rational, consists in severely pruning the tree in all its parts and moderately heading-in (see fig. 2). The heading-in occurs chiefly in the central and upper parts of the tree, for it is always desirable to reduce the height of the tree and in this way facilitate the work of spraying and harvesting. All dead and undesirable branches are removed, and all dead stubs sawed off closely.

Some growers spend much time and money in cleaning out, sterilizing, and cementing cavities. From a commercial standpoint it is doubtful whether it would pay to do much of such work, but where only a few trees require this kind of surgical treatment it may be worth while for the sake of conformity in the orchard.

The large wounds are usually protected by painting with either common lead and oil paint or coal-tar. The latter is well-suited to the purpose, but often contains so much creosote that it is likely to injure the bark around the wound. If the pruning is done in the fall the painting is usually left till spring when the wounds have become dry and "checked," in which condition they may be more completely sealed up. For very large wounds it is customary to tack a zinc plate over the surface immediately after painting. The plate is cut slightly smaller than the wound so that it will cover only the woody portion and thus allow the bark to heal over the edge, making a permanently tight joint. After sawing the shoulder off squarely around the opening, the hollow cavities, are treated in the same way.

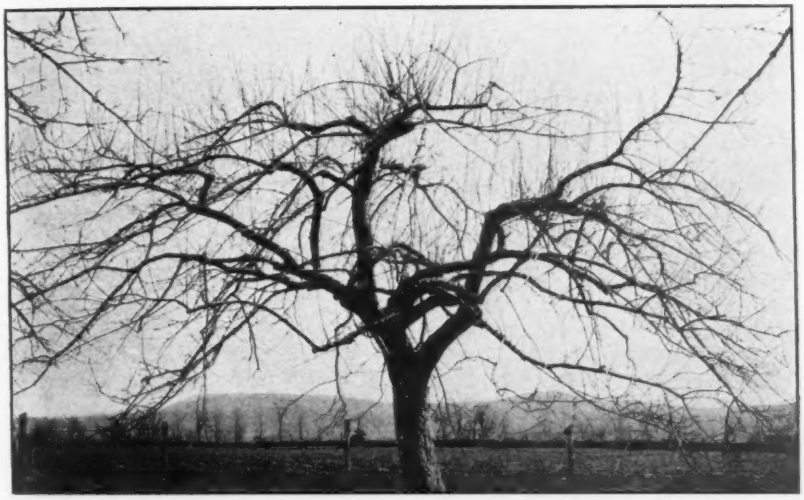
The second year's treatment of the severely pruned or "dehorned" trees is sometimes perplexing, especially when there has been a strong growth of watersprouts during the summer. For fairly vigorous trees it is sometimes advisable to thin out some of these watersprouts during the growing season. Such treatment, as is well known, will tend to reduce the vegetative development during the following season and will further tend to encourage the development of fruit buds. In most cases, however, the trees will not require pruning until they have become dormant. The work at that time consists mainly in the selection of the most desirable watersprouts and the elimination of the others. The selected shoots are usually cut back to about the fourth or fifth bud from the base. The subsequent treatment is much the same as that given young trees. The greatest danger is in leaving too many sprouts, for if the individual sprout has not sufficient room, it will not assume the desirable spreading habit. If the parent branches are undesirable and have not already been removed, they may be sawed off just beyond the selected watersprouts and

2. THE MOST RATIONAL METHOD OF RENOVATING A NEGLECTED TREE CONSISTS IN A SEVERE PRUNING AND HEADING IN. OBSERVE THE OPEN CENTER OF THE TREE SHOWN HERE.

the latter encouraged to take their places. After the new head is once formed it is important to keep the tree well opened up to prevent the branches from assuming the long slender habit, so characteristic of neglected trees.

Many people are of the opinion that the pruning work is all there is to the problem of orchard renovation. The orchards that have not been regularly cultivated, will need to have the sod broken up, and for this purpose the common practice is to use the cutaway harrow. This tool will leave the ground in much better condition and will cause less injury to the roots than the plough. Cultivation is usually continued till about August first when a cover-crop is sown.

The fertilizer treatment recommended consists in the use of about 300 pounds of muriate of potash and 600 pounds of basic slag per acre. About 400 pounds of raw ground bone may be substituted for the slag, but where this substitution is made it will usually be necessary to apply lime. It will be seen that no nitrogen is recommended, and it is probable that with the use of nitrogenous cover-crops none will be necessary. Where trees have been severely pruned and rigorously cultivated after a long period of neglect, there will be no further stimulation needed for at least two years. In the experience of the writer, trees treated as described above will make too much growth even without nitrogen and it often becomes necessary to allow the cover-crop to develop in the early summer instead of turning it under. When the cover-crop is allowed to grow, however, it is not harvested but simply cut at intervals and allowed to remain on the ground.



3. THE APPEARANCE OF A TREE ONE YEAR AFTER RENOVATION. OBSERVE THE GROWTH OF WATER SPROUTS IN ALL PARTS OF THE TREE.

The ultimate success with renovated orchards will depend largely upon keeping a close watch of the individual trees. The aim should be to maintain a uniform annual growth. The trees that are not making sufficient growth should be encouraged by severe winter pruning, by increased cultivation, and by nitrogenous fertilization. On the other hand, the trees that are making too much growth, and this is often more disastrous than too little, should be checked by summer pruning and by withholding cultivation and nitrogenous fertilization.

REQUISITES FOR SUCCESS IN ORCHARDING

By Edward VanAlstyne
Kinderhook, N. Y.

THE MAN

The man of the right type will make more of a success of an orchard on rather uncongenial soil, climate and location than will the man not thoroughly orchard-minded, under most favorable conditions. Too many are inoculated by the bacteria of orcharding who have an idea that all that is necessary is to buy orchard land, set it out with a great number and variety of trees, say to them metaphorically at least, "God bless you" and in five or six years, sit down under their shadows in great delight and count up the proceeds. They forget that it will cost about $40.00 per acre for the use of the land and care of the trees until they come into full fruitage. This does not take into account the cost of the trees. It will probably be eight or ten years before any substantial increase will be obtained from the orchard. Disaster stares the man in the face who has not the wherewithal to maintain himself during the interval of setting and profitable fruiting, or who sets so many trees that his land will not yield enough income to pay expenses while he waits, particularly if he expects to spend his time in sport and social duties. A man who expects to obtain a good income from his trees later on, must be willing to pay the price of intelligent painstaking care without reward for at least a decade. He must be willing to labour and to wait.

Given such a man in an orchard section, I know of no other industry which promises more, as long as he does not put out more trees than he can eventually take care of, which is a present day tendency. The most profitable orchards of the future will be those of medium size of a few standard varieties well cared for in every particular.

THE LAND AND LOCATION

The land may be ever so good but if it is located too far from market, or in a section isolated from other orchards or where the proper amount and quality of labour cannot be secured, it may be a failure.

As a rule the naturally well drained lands, in somewhat elevated locations, are best. There they get a better circulation of air and consequently, are less liable to injury by pests and fungus troubles. As a rule the codlin-moths are not so injurious in the higher altitudes where the night temperatures are low. No orchard should be set on land too steep to pass over with a sprayer, no matter how desirable the field may be in other ways.

It is important that one should distinguish between varieties of high commercial value and those of high quality but not profitable as market sorts because of weak growth or small bearing surface. Also that only varieties suited to the particular soil and climate where the orchard is should be set, as well as known and wanted varieties in the markets most accessible. It is the height of folly to set, except experimentally, varieties having great merit in another locality but never having been tried out elsewhere, particularly as there are enough climatable varieties which have been tried out. The country is full of orchards just coming into bearing in which are whole blocks of trees which must be grafted to make them profitable because the owner was beguiled into setting out varieties not suited to his location. It is always unwise for anyone coming into a community to ignore entirely its established customs and varieties. Both are likely to be founded on substantial grounds.

It is very important that the prospective orchardist should not be carried away by the fairy tales, too often heard as to the enormous wealth which will accrue to the apple grower. Statements such as this: "a man in Delaware sells enough net to buy an automobile from each acre of his orchard, annually" which recently I

saw in what should have been a respectable publication, and others equally wide of the mark are deceptive. Neither is it fair to take the income of some successful orchardist whose trees are in full bearing in one of the recent years of high prices after he has spent a decade or two in bringing the orchard up to that point and take that as a fair criterion. Doubtless $100.00 is a good average annual income from an acre of bearing orchard. This means $1000.00 from ten acres. It will usually be wiser to purchase a farm with a bearing orchard in it at two or three times the price rather than one in which the orchard has to be set and grown. In the first instance, one has an income from the start which will warrant the increase in price paid. When one has to establish an orchard, the cost of the trees and the care of them as well as the use of the land must be added to the purchase price. Often the latter will be more than the former. Then too, "hope deferred maketh the heart sick."

REFLECTIONS ABOUT APPLES

By Dr. J. P. Stewart

Experimental Pomologist, Pennsylvania Experiment Station (From the *Penn State Farmer*, with Slight Modifications by the Author)

IT probably has not occurred, even to the average apple enthusiast, that he is lending encouragement to one of America's great industries. Not great, perhaps as compared with our enormous corn industry, with its billion-and-a half dollar crops annually but, as compared with other fruits, and in its health-giving and life-cheering qualities generally, the American apple is truly great.

Just what the annual value of the apple crop is, it is difficult to estimate. As indicated by the census of 1900,—the latest available,—its value in 1899 was between fifty and sixty million dollars. This is farm value of the supply noted by the census takers. The retail value was doubtless at least twice as great. During that same year, the total value assigned to all fruits, including tree fruits, grapes, small fruits, citrus and other subtropical fruits, was slightly over $131,000,000. The value of the apple crop, therefore, was nearly as great as that of all other fruits combined. As compared with the total of all other deciduous tree fruits,—namely pears, apricots, cherries, peaches, nectarines, plums and prunes,—there were in 1900, over a third more apple trees of bearing age and nearly six times as many bushels of fruit.

During the decade just past, moreover, the interest in the apple has greatly increased. This is indicated by the great "booms" and high values of apple land in the far West and by the extensive commercial developments, under skilled direction, that are now coming on in the East and in many of the central states.

An interesting side-light upon this development appears in the fact that tree-planting seems to be increasing much faster than fruit production. Thus, between 1890 and 1900, the census shows that there was an increase in the number of bearing trees of about 67.9%, while the increase in yield was only 22½%, a difference of 3 to 1 in favor of the former. This lagging behind on the part of production is also very noticeable in the annual crop estimates of the *American Agriculturist* and in those of commercial organizations.

The causes for this condition are various. Increase in enemies and diseases, poor or ill-adapted varieties, the use of less suitable land, the entrance into the business of people not so well adapted to it, and probably not infrequently, the waning fertility of orchards formerly productive,—these are some of the factors that doubtless have an influence in keeping down the figures on production.

It is to the fertility factor, however, that we wish to call special attention. This is desirable, first, because we still

have people who doubt the value of fertilizer in any orchard, and, second, because there are others who go to the opposite extreme and assume its value in all cases. Either attitude is likely to prove costly to its possessor. After five years of work and experiments upon this point, we have come essentially to the following view. In some orchards, fertilization of the soil is the thing most needed. In them, it is essentially the key to the situation. In others, fertilizers may be applied at a loss.

THE ROW ON THE LEFT HAS RECEIVED NO FERTILIZER; THAT ON THE RIGHT HAS RECEIVED NITROGEN AND PHOSPHATE. THE NET INCREASE ON THE LATTER WAS $267 PER ACRE.

In support of this view, we may cite certain orchards that we have under experiment, in which fertilizer applications practically uniformly result in well loaded trees, while there is little or no fruit of any consequence upon the checks, the latter differing only in the absence of fertilization. In such orchards the gains from fertilization have run as high as 4 to 17 times the amount of fruit produced on the checks and have resulted in net profits of $120 to $420 per acre, even when the fruit is estimated at the low value of 50 cents per bushel. We have observed similar, though less marked results, from proper fertilization by commercial orchardists, over a wide range of territory. It is also reasonable to expect such responses, in view of the fact that the total plant food draft of a vigorous bearing orchard is really quite heavy,—more per acre for every constituent than is required by a 25-bushel crop of wheat,—and it is only because of certain special abilities and characteristics that trees are frequently able to maintain themselves for so long without some outside assistance in the way of fertilization. In the light of such evidence, therefore, it is impossible to really doubt the value of proper fertilizers in many orchards, and perhaps ultimately in any orchard that is actively producing and growing.

In other orchards, however, some of which are apparently very similar to those just referred to, fertilization has thus far produced no material response. Moreover, in a few cases, it has apparently done distinct and positive injury to the trees. The presence of such orchards makes it

inadvisable for anyone to make heavy and extensive applications of fertilizers in any case, until after the applications have been made to a few typical trees and have been proved successful. Sufficient time should be allowed before judging the results, and the character of the fertilizer and the time of application should be right.

On these points, we would say that results should hardly be expected before the season following the application, owing to the fact that fruit-bud formation occurs in the latter part of the season preceding blossoming. In character, the fertilizer should be a complete one unless it is definitely known that some one or more of the elements are already present and available in the soil in sufficient amounts or can be furnished in some other way. The fertilizer that we are recommending for bearing orchards is one carrying about 30 pounds of actual nitrogen, 50 pounds of actual P_2O_5, and 25 to 50 lb. K_2O per acre. Stable manure, of course, is also recommended, if available, at a rate of about 8 to 10 tons per acre. When plant food is really needed in an orchard, we have found that it is generally immaterial whether it be applied in the form of manure or commercial fertilizers, so long as all the necessary elements are added. The time for application of soluble fertilizers, like the nitrates, is probably best somewhat after petal-fall and not later than July 1. The phosphates and potash can probably be safely applied at any time, and hence it may well be done at the same time as the nitrates. Stable manure may be satisfactorily applied any time, except possibly late summer and early fall before the leaves are off.

ORCHARD OF MAIDEN BLUSH APPLES, NEAR PHILADELPHIA, PA.

The reasons for the variations in effect of fertilizers are of great interest and importance. These we are studying especially at the present time. In those cases, where the applications merely show no important effect, we have assumed that the activities of the trees are being controlled or limited by other factors than plant food. In such cases, the obvious procedure is to

determine, if possible, what the limiters are, and to correct them before wasting money and energy on factors already relatively favorable. Among these other possible limiters many may be cited, such as frosty locations, poor pollination, inherent sterility, insects, diseases, too much or too little moisture, improper pruning or bad care in other respects. It should be remembered that it is the unfavorable factors that primarily determine the crop, and that it is only with a properly balanced treatment of all factors or conditions that truly successful and economic production is possible.

In the cases where actual harm has resulted, apparently from fertilizer applications, the reasons for it are not entirely clear. The injury appears, however, to be connected with a toxic action, which is known to be exerted by many salts of the heavier metals when they occur alone in a nutrient solution or are distinctly dominant in a solution otherwise weak. This action is, therefore, most likely to result from heavy applications of muriate of potash, nitrate of soda, ammonium sulfate, and possibly from soluble metallic salts formed in acid phosphates. It is quite possible that the existence of this toxic action is largely responsible for the current preference, in many places, for organic carriers of the various fertilizer elements. In our observations, the injury has been confined largely, though not entirely, to muriate of potash applications, especially on relatively thin soils. Two years ago, we thought that the harmful agent was probably the chlorine accumulating from the applications of muriate. At present, however, we have quite clear evidence that the real toxic agent is the basic potassium ion, and that the action of the chlorine is only indirect and consists essentially in making the potassium more soluble. Similar effects can be obtained with the sulfate, only it takes more of it.

This point and the various observations of injury are treated rather fully in our annual report for the past year. In the present space, it is sufficient merely to say that the possibility of fertilizer injury makes it distinctly inadvisable to place any considerable amount of fertilizer in the holes at planting time or to apply it too closely about young trees, even as a top dressing, materials rich in soluble potash being especially dangerous. Young trees, moreover, are less likely to profit from fertilization than old ones, though trials should be made even with them, as we have some instances where relatively young trees are responding well. In such cases, a good mulch of stable manure, if available, is probably safest and best.

It should also be stated that, if our present toxic hypothesis is correct, muriate of potash is just as useful in the fertilization of apple trees or other fruits as any other form, and its lower price and greater solubility make it really preferable. Instead of changing to the sulfate or to wood ashes as the carrier, merely less of the muriate can be used, and if there is still danger of injury, it can doubtless be entirely removed by a heavy dressing of lime or of ground limestone. This means of neutralizing fertilizer injury is of special importance. Physiologically, lime is well known to be one of the most efficient neutralizers of the toxic action of bases, and our field experiments thus far clearly bear this out. It is quite possible, too, that some of the indifferent results that have been obtained from orchard fertilization in the past are connected with this toxic action of some of the mineral elements applied. At any rate, wherever fertilizers show uncertain or distinctly unfavorable action, it will be well to add lime to the soil before definitely concluding that fertilization is of no avail. If then their action is still insufficient to show a profit, it is probable that other factors are limiting the crops, and attention should be given to them until a balanced condition is attained, when fertilization may again prove satisfactory and profitable.

THE SUCCESSFUL WOMAN IN THE COUNTRY

By Frances E. Wheeler
Chazy, N. Y.

VERY many times has the Mistress of "Clovernook" thought of the fine women students of our Cornell Agricultural College, with whom two years ago, she had the pleasure of talking concerning rural life for women. Very many times has she wished that she could know if her words were of any help and if these women are prospering in their work. Now, through the pages of the CORNELL COUNTRYMAN, I have the opportunity to speak on the problem of self-support for women in outdoor work.

Of course, self-support (which certainly includes some extra pennies—enough to make comfortable the days of folded hands) is a very serious matter for a woman to undertake. The measure of her success must greatly depend on her wise choice of the kind of work adapted to her individuality, the amount of common sense, faithful thoroughness, and perseverance which she has in stock, or can develop.

WHITE HOLLAND TURKEY.

My own trail was blazed for me which in many ways was fortunate. It saves a mistaken choice of environment and leaves sufficient margin for development. From experience gleaned from about 17 years of self-supporting rural life, I am convinced that it is not so much what one does as how one does it; not so much *where* one begins, as *how* one begins.

While I realize that there are women who are successful specialists in various agricultural lines, I still believe that for the average woman, a small farm and a variety of interests is in the long run, most satisfactory.

At "Clovernook" we have only about an acre and a half of land but our turkeys have a grand range over farms adjoining ours. The other fowls have this range also although they are kept partially yarded most of the time. As only about a third of this land is available for agricultural purposes it would seem to many somewhat amusing to expect to obtain even a hand-to-mouth living from so small an acreage, yet anyone who saw the place seventeen years ago would realize very keenly how many hundred of dollars in surplus earnings must have gone back into the property to bring it up to its present thrifty condition and comfort.

All through these seventeen years "One hand has washed the other" to speak figuratively. The poultry, especially ducks, have enriched the impoverished land, enabling the production of big crops of currants and strawberries. We have raised and marketed in one season on less than a quarter of an acre two thousand ducks. We have propagated from the cuttings of twelve currant bushes, some five hundred plants. These, on about an eighth of an acre, yield a crop of 1700 lbs. of fruit per season. We have produced in a bed 30 by 40 ft. in size, 100 lbs. of strawberries and from our 200 plants have sold $30 worth and set out a bed of 1000 plants for ourselves.

The fact that mother and I live alone has necessitated the employment of hired help very extensively in the cultivation of small fruits, in keeping the place in order, and especially during the years of duck rearing.

When these fowls ceased to be profitable, owing to several reasons, the market branch of the business was dropped and a limited number of stock for first class breeders was substituted. In fact, we have had to confine ourselves to a line of breeders producing poultry and eggs, in all the poultry branches, owing to inability to give the other side the necessary personal attention.

The "Clovernook" apiary is what brought in our first pennies and has always been an income and a help in developing the other branches of usefulness.

I trust the readers will pardon this personal digression for I simply wish to illustrate what can be done with a very small farm, when the disadvantages of a northern climate near Montreal and distant markets must be met.

The special advantages to a woman on a small place are: that she can do so much of the work herself since it is not of a nature which is hard for a woman and that there is variety and never flagging interest.

It is true when fall comes, plans are made for warm winter housing and the grain bill mounts up, the egg problem grows more difficult of a happy solution. Then it is a great comfort to see our plants tucked snugly beneath their winter blankets of straw and snow and our bees contentedly hibernating in the cellar. It is also a great comfort to know that we need have no further care for those branches until spring. In fact, we can go off for a long vacation, a trip to Europe if we like, and no harm will come to them. But, "home for chores," grows extremely monotonous as time wears on and who of us would not take such a rest if we could?

Many have asked me, "What part of your work do you like best and which is most profitable?"

Unquestionably, in proportion to the time and money invested, my bees are most profitable and are most satisfactory. For these reasons they are most enjoyable. Next to them are the White Holland Turkeys.

The initial outlay of an apiary is very small and the outfit is a light one. It may be enlarged very cheaply. The fact that the food costs nothing is a great item and that it will be gathered freely in any locality where man or beast can live is another. I had 64 colonies one year and 32 of them harvested five tons of honey.

The advantages of bee keeping are many. Ten by fourteen feet will hold ten colonies which will produce from 50 to 300 lbs. of honey each and require only a couple of hours' work once in about every ten days during the blossoming season. They are intensely interesting little creatures and are not hard to manipulate nor to understand how to manage.

GAS ENGINES NOW SUPPLANT STEAM

By C. F. Hirshfield

Professor of Power Engineering, Cornell University

THAT the modern gas engine is superior under all conditions to the once all important steam engine was the purport of Professor C. F. Hirshfield's lecture on "Gas Power" before the Sigma Xi Society in Rockefeller Hall.

"In efficiency, variety of application, simplicity of structure, and portability, the modern gas engine is superior to the steam engine. The internal combustion gas engine also decreases the danger from fire, always present in the use of the steam engine with its external combustion.

"The effect of the gas engine upon agriculture has most interesting economic aspects. Agriculture is undoubtedly the backbone of human endeavors. Cities, manufacturing industries and artificial products of civilization rest on the foundation of agriculture, and

anything that improves agriculture, influences civilization, and is a noble consideration.

"The return from one unit of agricultural economic work is approximately fixed and the only way for the farmer to increase his income is to handle more units. This can readily be done by power machinery but gas has shown itself to be the only satisfactory driving power. Steam is too costly, too absorbing and too dangerous.

"Take for example the plowing of one man's land. More power is expended annually in plowing than in all other departments of human endeavor combined. It takes one man and two horses five hours to plow one acre of ground, and a man walks a distance of 5,000 miles in plowing one square mile of land. As the period for preparation of the soil is limited, the extent of the work that can be done is simply a matter of the number of workers employed upon the ground. Horses can work only at a limited speed which varies with the weather, soil and other conditions. A gas tractor can haul from four to twenty plows at an even greater rate of speed than can the horse, can work 24 hours a day if necessary, and can be operated by one person without fatigue.

"Again, milking and skimming, transporting and churning milk can be accomplished faster, and easier by means of gas power. Possibilities also in the form of running water and sewerage systems, electric light plants, etc., are opened to small communities by the gas engine."

FOR BETTER GRADING AND PACKING OF EASTERN APPLES

By H. B. Knapp, '12

[Delivered before the New York State Fruit Growers' Association at Rochester on Jan. 4th, 1912. This speech was awarded first prize in the contest in which there were five students of the College entered.]

WE ALL admire the splendid fruit with which the western growers have invaded our markets, fruit which has often put the product of our eastern orchards to shame. We admire it for its beauty, its size, its uniformity, and the attractiveness with which it is packed, we also not only admire, but envy the price which it brings. We have heard so much about the opportunities for the fruit industry in the West, so many almost marvelous reports of the remarkable productiveness and quick maturity attained in that western clime, that the advantages of our own State in this special field of agriculture seem by comparison to sink into obscurity.

It seems to me, however, that when we take up one by one and consider carefully the natural factors which go far toward making the business of fruit-growing a success or failure that we find that we must look further and deeper; that we of the East cannot put the responsibility or blame for our secondary position in the realm of modern orchard management upon natural advantages, or disadvantages. In fact, such a consideration makes our present position seem still more open to condemnation.

The three factors which will, other things being equal, shape the map of our country in which fruit can be grown successfully on a commercial scale are: climate, soils, and markets.

The point of greatest importance in regard to climate, eliminating the points of liability to frost at blossoming time, of winter injury, and of sunscald, factors which certainly do not favor the western grower, is the supply of moisture during the growing season. When we stop to consider that the thing which a young and growing tree needs above all things is water, and when we consider that a crop of fruit

is from 85–90 per cent. water, then we realize that the question of moisture supply is an all-important one.

The famous Hood River Valley of Oregon has during the six growing months seventeen inches of rainfall, the Rogue River Valley at Medford, Oregon, has six inches, the Wenatchee Valley of Washington has six inches, and the Yakima Valley, in the same state has three inches. These are, with one exception, twenty year averages. More than this, one-half of the amounts given fall in the respective regions during the first two of the growing months. After that the dry season is on in earnest and the rains for the next three months do not amount to much more than our dews in New York.

Geneva, in Ontario County, has nineteen inches of rainfall during the growing season, Rose, in Wayne County, has nearly twenty inches, and Rochester, in Monroe County, has almost the same amount. Moreover, the extent of the rainfall from month to month varies barely an inch throughout the season in any of these sections. Then when we further consider that with ordinary methods of conservation, eighteen inches of rainfall, distributed as evenly as it is in this state is none too much for the best results, we begin to understand why the westerner tills his orchard from fifteen to twenty times a season, and why he is such an ardent advocate of irrigation. He is because he has to be. Such operations cost money, and you do not see these things dwelt upon in the profusely illustrated prospectuses sent out by these western sections.

It is only fair to state that the westerner can put on his fruit an intangible something which gives it a little better color and higher finish than we can obtain here. I think all of us will concede this, but when we have said this, we have said all there is to say in favor of western climatic conditions.

It is hardly necessary to take up the factor of soils. With our present knowledge of the types of soils best suited to fruit production, a single glance at the soil map of New York State, as compared with those of her western rivals, will convince us that we can never more closely approximate ideal soil conditions and on so large a scale than we can in the Empire State. New York leads all other states in the variety and number of crops grown, because of the great variety and productivity of her soils. A westerner smiles unbelievingly when you tell him that five towns in western New York ship more apples than the states of Oregon and Washington combined. The output of the West and Northwest in 1910 was from twenty to twenty-five thousand carloads of apples, the output of the eastern states was one hundred fifty to one hundred sixty thousand carloads, of which New York produced the major portion. It is not that western soil conditions are not good, but that eastern soil conditions are better—and there are a lot more of them.

When it comes to the third factor in fruit-growing markets, we have the westerners at our mercy. The great bulk of their fruit comes clear across the continent at considerable expense for expressage and refrigeration to be sold in eastern markets at our very doors. It costs fifty cents to ship a box east. With the best of train service fruit sent from Oregon cannot be sold in Chicago before the morning of the eighth day, in New York City before the morning of the eleventh day and in Boston before the morning of the twelfth day. What a disadvantage we would consider it if we had to face such a proposition.

Clearly it is not the East that is suffering from natural obstacles. I should like to offer this statement of Dean Bailey's. He says: "I have visited the splendid Hood River Valley of Oregon, with its remarkable productiveness and wonderful possibilities; I have traversed every great fruit-growing section of the Golden West, and nowhere have I found one to compare with the Ontario Lake Region of New York State."

And so it seems to me that we must look still further if we are to discover the true cause of western success, I might almost say supremacy, in the realm of fruit production.

The secret of this success, in my opinion, lies in the superior grading and packing done by the western man. For this he does not deserve so much credit as might at first be supposed. As with frequent tillage and irrigation, he grades and packs as he does because he simply has to. His great distance from market and high transportation charges force him to eliminate his poor and undersized fruit because it does not pay to ship it, and the type of package which he has found most suitable, the bushel box, does not permit of more than a slight variation in size of fruit in any one package. The western man has graded better because he could no nothing else and live. We will grade just as well when we have to, but I hope we shall begin before that time comes. It will be more to our credit morally and financially if we do so.

Now, the box in eastern orchards is a comparatively new and untried thing, and I presume you are expecting me, as a college man, to enthusiastically advócate its adoption as a remedy for the defects in eastern orchard management because one of the chief attributes with which a college man is popularly endowed is a desire for something different, something new. I am not going to do any such thing. I consider that there is not of necessity any conflict between the barrel and the box, each has its own sphere and its own limitations, and personally, I consider the sphere of the box much narrower and its limitations much greater than those of the barrel. Moreover, under ordinary conditions, I believe it to be folly to attempt to compete with the westerner in a project in which he has such a lead, and in which he is doing so well. I do think that a comparison may well be made between western grading and eastern grading, and with the prospects of a great increase in fruit supply in the future, it seems to me that it would be well to consider this possibility at once.

Mr. J. A. Cohill, manager of the seven hundred acre orchard of Tonoloway Orchard Company of Hancock, Maryland says:

"The value of accurate grading of fruit to a uniform size and appearance is the selling factor of any package be it a barrel or a box," and it seems to me that this is the lesson, first of all which we should learn from our western friends.

But you say that the western man obtains often from eighty-five to ninety per cent. first class fruit while eastern fruit will not as a rule run as high as forty per cent. first class, or fancy. We must then obtain the fruit to grade before we can accomplish much in a practical way.

The success of the western man in this respect is not due to absence of insect pests and plant diseases, for he has plenty; it may in some measure be due to his more intensive methods of spraying and cultivation, but it is in my opinion chiefly due to thorough and systematic thinning of his fruit. It pays him to thin; he knows it and we know it; why will it not pay us? When we leave four Baldwins in a cluster on a heavily loaded tree, so loaded and borne down that the under branches do not get a ray of sunlight, we cannot in reason expect that the apples in that cluster will develop as they should, or that the product of the entire tree will be of more than indifferent value.

When an industry has reached such a stage in its development as the apple industry has reached, when everyone knows how to grow fruit of some sort and competition is keen, then it is as true as with any other industry, quantity must give place to quality and the article which you produce will not be valued according to its bulk, but according to its merits, to its points of superiority over the article produced by your competitor. This has always been true and it is none the less true to-day.

It has already been demonstrated that thinning is a practical operation. Mr. T. D. Whitney, of Stanley, says that last season he thinned eighty per cent. of his 173 Baldwin trees and nearly all of his 70 Rhode Island *Greening* trees. He barreled 964 barrels of Greenings, 734 barrels of which were No. 1 and fancy, 2½ inches or over in diameter and 230 barrels were No. 2 grading 2¼ inches in diameter. He says he thinks his first grade Baldwins were increased twenty-five per cent and his Greenings around ten per cent. The wide range in prices even at the present time he attributes in large measure to the difference in size of fruit. He says large apples can be picked ten to twenty per cent cheaper and packed fifteen to thirty per cent cheaper. His picking last season cost him less than ten cents a barrel and his packing less than nine cents per barrel, help working by the day. He is convinced that by thinning he gets a much larger per cent of first grade fruit and each succeeding year seems to add to the premium on large fruit. He remarks very truthfully that as one thins his fruit he gets more interested in the growing crop which leads to better care in spraying and cultivation.

Mr. Lloyd S. Tenny, of Hilton, is another ardent advocate of thinning. He says it can be done for five cents per barrel, a man thinning four trees yielding six to eight barrels per tree in a day, and that he can obtain twenty-five cents more per barrel for his fruit on the trees. He says further, that he can keep his gang of men employed through the summer and thus is equipped with help when the picking season opens. The danger of breaking is also lessened and the vitality of the tree is not so severely sapped as to impair its future usefulness.

When practical men come out and openly advocate such a policy, is it not time to consider that it has passed from the realm of theory and is worthy of a fair trial? Of the men I know who have done this, I do not know of one who has failed to keep it up.

And so, gentlemen, I believe I am justified in saying that we should thin our fruit in order to obtain what we need above all things, a better and more uniform product.

But let us in the meantime put up an honest pack, as good in the middle as it is on the ends. Much has been said about the poor apples in the center of the eastern barrel, perhaps too much has been said, but this you know is in many cases true, that the smaller apples work down through their larger companions until they get to the middle of the barrel, and, this is the strangest part of all, in opposition to whatever law they were previously obeying, they elect to stay in the middle of the barrel. I would eliminate this tendency and avoid this temptation by doing away with the small apples.

We, at present, have an apple law which is good as far as it goes, but I believe we should have one similar to the one in force in Canada, requiring the name of the packer on every barrel of fruit, or if it is repacked, the name of the person, or firm, who does it.

In this way, and in this way only, it seems to me can we put our hand on the evil itself and deal with it accordingly. I should like to see this Association before its adjournment appoint a committee to consider this matter and to prepare a set of resolutions concerning it to be presented at the next session of our legislature.

And let us always remember that we are in the best place in the world to grow fruit, that if we fail here it cannot be attributed to natural factors, but to our own shortcomings. When we care for our orchards as the westerners care for theirs, thin our fruit as they thin it, grade it as they grade it, and pack it as carefully as they pack theirs, then the splendors of the Hood River Valley and other sections of the West will no longer be enumerated as typical of the fruit production of this country of ours, but with pride we can point to the orchards, dotting our own hills and valleys, and say with entire truth "these are unsurpassed."

THE CONTROL OF THE PEAR PSYLLA BY SPRAYING FOR FLIES, EGGS AND NYMPHS

By H. E. Hodgkiss

Assistant Entomologist, New York Agricultural Experiment Station, Geneva, N. Y.

THE pear has fewer insect enemies than most kinds of fruit. Among the species that attack the pear, the psylla has attained preëminence. Fruit growers, generally, believe that it rivals the San José scale in destructiveness, and that during years of its superabundance it is a more difficult pest to combat. Some orchards are annually threatened with injurious numbers of this insect, while in recent years the period of 1909–1911 is notable for a widespread invasion of the pear orchards of western New York. The losses occasioned in 1910 aroused the pear growers to the importance of the psylla, and has provoked as never before a demand for information for efficient methods of control.

The injuries from the pear psylla are caused by the extraction of plant juices by the nymphs which feed upon the leaves and fruits. During May and June when the trees should be making the best growth the first brood of psyllas is developing. The continual sapping of the plant juices of the leaves and from the bases of the newly-forming buds by the insects causes a marked retardation in growth, with a subsequent dropping of the foliage and the arresting of the development of the fruit buds for the succeeding year. The trees sustaining such injuries are very susceptible to winter killing, to which many often succumb.

PSYLLA—1ST STAGE.

PSYLLA EGGS.

The time during which control measures can be successfully practiced against the first brood is limited to the period which includes the life events of the swelling of the buds and the dropping of the blossoms. Doubtless failures to check the ravages of the psylla in past years have been largely due to the meager information which has been available concerning the habits of the pest. Nearly all of our insects have one or more vulnerable stages in their life history, and it was believed that a study of the life cycle of this species, especially of the first brood, would provide a sufficient knowledge of the habits and seasonal history to determine the period during which certain practices could be profitably used to supplement present methods of control.

The abundance of the psylla during the past two years afforded an ample opportunity to watch the activities of the first brood of the insects. In 1910, the adults or "flies" which pass the

ACTIVITIES OF THE FIRST BROOD OF PSYLLA AND CONDITION OF TREES DURING 1910 AND 1911

Date	1910 Activities of Insects	1910 Conditions of Trees	1911 Activities of Insects	1911 Condition of Trees
Mar. 26	Flies appearing			
27			Flies appearing	
28				
29				
30			Flies under bark	
31				
Apr. 1				
2	Eggs being laid			
3				
4	Flies most numerous		A few flies appear	
5		Blossom buds breaking		
6				
7	Most eggs, ice storm driven flies under bark		Flies most numerous	
8		Tips of buds separating		
9				
10				
11				
12				
13				
14			First eggs	
15				Blossom buds breaking
16	Many eggs collapsing			
17				
18		Leaf buds open		
19	Eggs hatching			
20	Few nymphs			
21				
22		Blossom buds opening		
23				
24				
25	Nymphs dying from rains and cold			
26				
27				
28			Most eggs	
29				
30	Nymphs most numerous			
May 1			First nymphs	
2				
3				
4	Last flies	Full bloom		
5				
6				
7				
8				Blossom buds opening
9		Blossoms drop		
10				
11				Full bloom
12				
13				
14				
15			Most nymphs	Blossoms drop

PSYLLA—5TH STAGE.

winter principally beneath the loose bark of the trees, emerged on March 26 and the deposition of eggs commenced on April 2. The season of 1911 was somewhat less advanced; the final emergence of the flies took place on April 6 and the first oviposition occurred April 14. A similar although less sharply defined period is noticeable between the egg and nymphal stages. The nymphs were first observed respectively on April 19, 1910, and May 2, 1911. The divergence in the dates of appearance of the several stages of the first brood of the psylla during these years is attributable to prevailing weather conditions. But with the maturing of the blossoms the nymphs were each year in the fourth stage. An intermingling of the flies, eggs and nymphs occurred to some extent, which was thought to be inconsiderable. The accompanying table, which is based on observations in orchards during1910 and 1911, shows the occurrence of the first brood of psylla with respect to the conditions of growth of the trees.

On the basis of these observations it was deemed practicable to spray for the psylla in one or all of the three stages. This idea was followed in some forty orchards throughout the pear-growing districts of the state. The operations were undertaken by each orchardist with his usual equipment and, while the applications were made under direction, the work accomplished is an indication of what may be expected if the operations are conducted carefully.

The first stage of the operations was directed upon the hibernating flies. The miscible oils, oil emulsions, soap and a nicotine preparation were used for this purpose. One of the interesting results gained by this experience was that in some orchards in which the bark was removed the psylla was entirely controlled by this application, while for the most part in unscraped orchards a sufficient number of the flies remained to render a second spraying advisable. It was also found necessary to spray each tree separately. The usual practice of spraying all the trees on one side and returning through the orchard on the opposite side was demonstrated to be impracticable because of the habit of the species of seeking protection on the sheltered portion of the tree.

The orchards in which control of the pest had not been successfully attained by the first spraying to kill the flies were then sprayed with the lime-sulphur wash at winter strength to kill the eggs. This treatment was made during the last week in April and the first week of May, at which time the buds were compact in the cluster. The result of this application was an

ADULT PSYLLA.

almost complete eradication of the insect in most of the orchards. Some eggs which were subsequently laid upon the trees hatched, but the numbers of the nymphs were so small that spraying for these was deemed unnecessary; and in no instance did the natural increase of the insect cause noticeable injuries during the remainder of the season.

Only a few plantings required a third treatment, but some orchardists desired to remove all chance of further damage and made a third treatment to kill the newly-hatched nymphs. Some pear-growers were unable to make the applications against the flies and the eggs, so these men sprayed for the nymphs. This gave an opportunity to compare the results of the spraying in orchards in which the entire plan was practised with the results obtained from a single treatment for the larval stages. The usual contact sprays were employed for this purpose, and were applied soon after the blossoms dropped. The results of this treatment were very gratifying and, even in those orchards which had not been previously sprayed, the infestation was destroyed. None of the trees required further treatment and they put forth a vigorous growth during the balance of the season.

The chief factors for the successful control of the psylla are: (1) an acquaintance with the appearance of the individual stages of the first brood, the flies, eggs and nymphs; (2) a familiarity with the development of the psylla in relation to the growth of the buds of the tree; (3) thoroughness in making the applications.

A knowledge of the time periods in which the condition of the trees with respect to the growth of the buds will indicate the stage of the insect at that particular period, is an invaluable asset to the orchardist. The manner in which the sprays are applied should receive particular attention. Many failures attributed to the insecticide would be avoided if more attention were given to the manner in which the applications were made.

Pear-growers as a rule have become more hopeful for the control of the psylla, and many orchardists have gained an added interest in pear-growing since it has been demonstrated to their satisfaction that by systematic spraying against the first brood the pear psylla can be relegated to a comparatively unimportant place among orchard pests.

FRUIT GROWING IN OREGON

By C. I. Lewis, M.S.A., '05

Chief, Division of Horticulture, Oregon Agricultural College and Experiment Station

OREGON is a state which contains many extremes of natural conditions. For instance, the rainfall varies from one hundred thirty inches to as low as two inches. There are regions where frost is hardly ever known whereas some sections have very severe winters. In some locations the summer heat is never very intense while in others it reaches a high degree. The elevation varies from sea level to snow line and the soil is from heavy adobe to the lightest silt and sand. Eventually we will probably find that with these extreme conditions there will be very few varieties of deciduous fruits but will succeed in some parts of the state. Eastern men in writing of the Pacific Coast conditions generally admit that we have the color, size, and attractive appearance of fruits but that we do not have the quality. Such statements are misleading, and eastern horticulturists should not preach this gospel among their fruit growers for they are simply chasing the rainbow. Probably no one section in the United States can grow all varieties superior to any other section. Varieties to be grown at their best must find their special requirements fulfilled. I am collecting

each year apples from all over the United States and find that no one region is superior to all others for all varieties. Experience has shown that in some sections of the state a certain variety will not grow; the quality will not develop under the climatic and soil conditions found, but in other sections the variety will grow to a superb degree of quality. As a rule such varieties as the Baldwin, Northern Spy and Rhode Island *Greening* do not have as much quality with us as in some other sections of the country, but who ever has seen the Wenatchee Winesap, the Hood River Spitzenberg, the Willamette plums, prunes, and cherries, and then say these fruits do not have quality are either crazy or prejudiced.

The real elements of success in Oregon fruit growing are due, first to very productive soil, and second to very favorable climatic conditions, which taken together produce fruit of remarkable size, high degree of color, relatively free from blemishes, and produce the fruit in large quantities. Under these conditions trees come into bearing at an early age and in many cases are apt to bear regularly. Nature has been kind to the Pacific Coast in giving them ideal conditions for producing high class fruit, and coupled with what nature has done the fruit growers have done their part. The most intensive methods of cultivation, pruning, thinning, spraying, etc., are practiced. Growers are eager to find new methods they can use that will improve the quality or yield of their trees. Progressive methods are used in handling the crop. Pruning, packing, precooling, and shipping, are all given careful attention. No section of the country that I have ever visited practices such careful methods in preparing the fruit for the market as does our own state of Oregon. Business methods play an enormous part in our success in fruit growing. First, as regards selling, our system of organizing and finding the right markets has produced most excellent results; not only the business methods used in preparing and selling the fruit but also in growing it. The cause of the adoption of such progressive and such good sound business methods in conducting our fruit growing is the personal element. Perhaps there is no other line of agriculture in which the personal element plays such an important part as does fruit growing. Our fruit growers as a whole are wide awake, brainy men; many of them are men with a great deal of business training and executive ability; men of big ideas and optimism. They believe in their country and are not afraid to spend money when they can see the expenditure is going to bring results. The result of such characteristics means carefully handled orchards and splendid type of homes. In fact, the whole atmosphere surrounding fruit growing is an attractive one. Each valley has its University Club with members from such institutions as Harvard, Yale, Columbia, Cornell, Chicago, Wisconsin, etc. Above all, these men thoroughly enjoy outdoor life. They are enthusiastic over their business and are men who love agriculture. Is it any wonder then that with our soil, our climate, and with such a class of men conducting our fruit industry that success becomes our byword and failure is not recognized in our vocabulary?

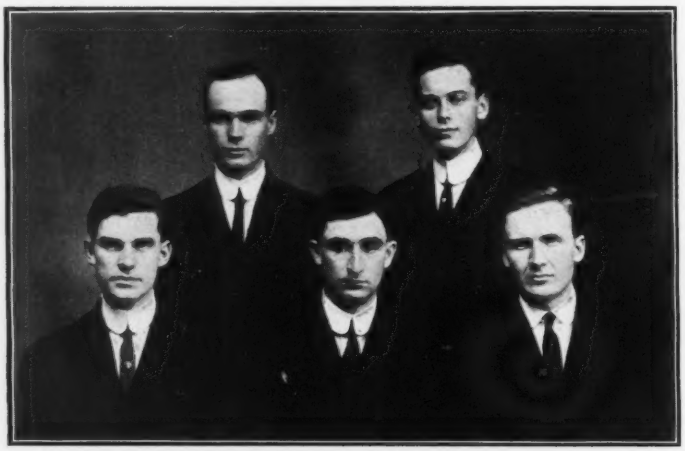
NEW YORK STATE FRUIT GROWERS' CONVENTION

By Dudley Alleman, '14

THE astonishing increase of interest shown in Horticulture was typified by the eleventh annual meeting of the New York State Fruit Growers' Association, held in Convention Hall, Rochester, January third, fourth, and fifth. The exhibits, both of orchard produce and of the necessary adjuncts for successful fruit raising were interesting and instructive. In the Secretary's report it was stated that the membership of the association had passed the one thousand mark. Much coöperative buying of spraying materials was done during the past year.

The Cornell Departments of Entomology, Plant Pathology and Farm Mechanics were represented with large educational exhibits. The latter attracted considerable attention with the exhibit of the "Cornell Sprayo-graph" and the demonstrations of spraying against the wind. Cornell students to the number of about one hundred and fifty from the Department of Pomology were present. A number of these did judging in the fruit exhibit which was held in conjunction with the meeting.

A feature of the meeting was a speaking contest open to Cornell students in the Department of Pomology. After a keen competition, W. H. Hook, '12, H. B. Knapp, '12, F. E. Rogers, Sp., E. C. Auchter, '12, and E. A. Brown, '13, were selected to address the meeting. Both the subject matter and the delivery of the speeches was very commendable. H. B. Knapp, whose speech appears in this issue, won the first prize of $35 and F. E. Rogers won the second prize of $15. After the contest a fruit grower in the audience very generously gave a prize of $10 to each of the other three contestants.



Back row, left to right: H. B. KNAPP, E. C. AUCHTER.
Front row: E. A. BROWN, F. E. ROGERS, W. H. HOOK.

President Clark Allis of Medina, in his address severely censured President Taft for his apparent attitude against agriculture. He also discussed cold storage.

Wednesday afternoon was devoted

(*Continued on page* 172)

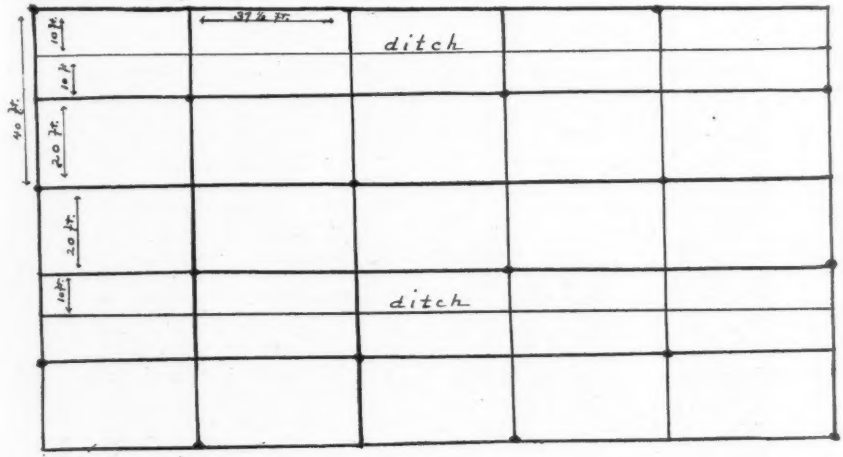
ORCHARD DRAINAGE

By T. B. Wilson
Hall, N. Y.

ONE of the most important things to consider in planting an orchard is whether or not the soil is sufficiently dry. An orchard planted on wet or springy ground will not thrive. Any observing person, in traveling through the country, can see many examples of parts of orchards not doing well, or some trees dying, in places where the land is low, and where water is liable to collect, without a free outlet. Then, too, the soil formation may be such as to retain or hold back the water. There may be a few sections in New York State where orchards will thrive without underdraining. In general, either before the orchard is planted or shortly after, the surplus of water must be removed by underdraining.

In underdraining a field for an orchard, it is not necessary to drain very close, but the drains ought to be at least three feet deep, unless one has a very sticky and retentive clay subsoil Ordinarily a drain between every other row of trees will drain sufficiently.

I have one orchard set on the diagonal system, where the rows north and south are 37½ feet apart, east and west the rows are 20 feet apart, but the first tree in the first row is 40 feet from the second tree in that row, and the first tree in the second row is half-way between the first and second tree in the first row.



General Plan of Orchard on farm of T.B. Wilson, Hall, N.Y.

I run the lateral drains east and west, straight up and down the hill. The first drain is 10 feet from the first row of trees, or the first tree in the first row; the second drain is 60 feet from the first drain, or 30 feet from the second tree in the first row. In this system, we have two-thirds of the trees within 10 feet of a drain, and the remaining one-third are 30 feet from any drain.

In any ordinary New York condition, this is sufficient drainage for an orchard if the drains can be put 3 or 3½ feet deep.

Thorough drainage is the foundation of better agriculture.

The Cornell Countryman

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FEBRUARY, 1912

Council Plans

The first meeting of the new "Agricultural College Council" was held on Saturday morning, January 6th, in the President's office, and again that afternoon in the College of Agriculture, with a partial attendance. Everything at present needed for the administration of the College was done at this time. The duties of the Director were defined and the general policies of the College were formulated.

Subject to the approval of the Board of Trustees, the Council, which was created at the last meeting of the Trustees, has entire control over the administration of the College and all of the farms belonging to it. In the interim between its meetings the Director has full charge, except in the appointing of assistant professors and professors. He and the Treasurer of the University, although not members of the Council, are expected to attend all of its meetings. Four meetings must be held and as many others as may be deemed necessary. The next meeting will be before the spring meeting of the Trustees. All future Ithaca meetings will be held in the College of Agriculture itself.

By statute the Council is entitled to a member of the Committee on Grounds, and Col. H. W. Sackett, '75, was elected. Two members of the Building Committee, Willard Beahan, '78, and Hon. F. C. Stevens, former Superintendent of Public Works, were elected. Two committees appointed were: Audits and Accounts—T. B. Wilson, '88, J. N. Carlisle, and F. C. Stevens; Farms—W. F. Pratt (State Grange Trustee), R. A. Pearson, '94 (President of the State Agricultural Society), and T. B. Wilson, '88.

Those present were: State trustees, H. W. Sackett, '75, T. B. Wilson, '88, F. H. Miller; W. F. Pratt; two trustees elected by the Board of Trustees, Willard Beahan, '78, J. H. Barr, '89, and President Schurman. Dean Bailey and Treasurer Williams also attended.

School of Forestry

Seldom does the COUNTRYMAN have occasion to relate such an excellent bit of news as the recent announcement that Professor Filbert Roth—present head of the Michigan School of Forestry—is to come to Cornell next fall to take charge of our new School of Forestry. Everyone was well pleased last February to learn that a Department of Forestry was to be re-established at Cornell and that Professor Mulford was coming to take charge of it. The recent appointment of John Bentley, Jr., as Assistant Professor and now the acceptance of Professor Roth seem to bear out the proverb that good fortune never comes singly. Professor Mulford was Asst.

Professor of Forestry at Michigan under Professor Roth and it is undoubtedly largely due to his influence that the appointment of Professor Roth has been brought about. Eight years spent on the Western frontier, eight years of study at Michigan, seven years in the National Forest Service, and twelve years as university professor certainly promise a wonderful fitness for the teaching of forestry. As a matter of fact, Professor Roth is considered the greatest teacher of forestry in the United States.

It is especially fortunate that Professor Roth should come to Cornell as he was Assistant Professor of Forestry here in the original school from its inception in 1898 to 1901.

Born in Wurtemburg, Germany, in 1858, Professor Roth came to the United States in 1871. The period between 1874 and 1882 he spent on the western frontier. From 1885 to 1839 he studied at Michigan. Then for five years he was a special timber expert in the Department of Agriculture. After leaving Cornell he again went into the Forest Service, having charge of all the forest reserves. Since 1903 he has been at the head of the School of Forestry at Michigan, the third oldest of any importance in the country and the second largest.

The COUNTRYMAN can but express the gratitude of the undergraduates to the Faculty of the College of Agriculture and to Professor Mulford in obtaining the services of Professor Roth. Cornell established the *first* school of forestry in the United States—we see no reason why Cornell should not now have the *best* school of forestry in the United States.

Office Chat

It is with regret that we announce the resignation of Wilfred De S. Wilson, '13, from the board, and we extend him our sincere thanks for the earnest work he always gave to the paper.

* * *

The present issue is the second special number which we have published this year, and we trust it will meet your approval. So great has the interest in fruit farming become, that we deemed it worthy of a special number, and have endeavored to have it presented from all points of view by the highest authorities.

In obtaining articles this year, we have endeavored to select subjects which would be of most interest to all our readers, and authors in whom they have the most confidence. For the hearty good will, and ready response of these authors, we wish to express at this time our sincere thanks and appreciation.

This is the first number of the paper for the second semester, and by this time you have had an opportunity to become acquainted with our general aims and purposes. Our plans for the remainder of this year are about completed, but as we start planning for our Fall numbers, we are open for suggestions, and would be glad to hear an expression of opinion from our readers. What subjects are you most interested in? Do the special numbers appeal to you? What new departments would you like to see started? How many student articles do you like? Would competitions for articles or covers appeal to you? Are we printing too many pictures? Have you any criti-

cism? (Bouquets are out of order–they require attention, and soon wither). Let us hear from you, and do not forget to mention who and what you are doing—we may want to classify you under "Former Students!"

Students' Association Banquet

The annual meeting of the Students' Association of the New York State College of Agriculture will convene on Wednesday, February 21st, 1912, at 10 A. M., the session continuing until 1 P. M. A strong country-life program is being prepared to include speakers of national reputation, such as Director Bailey, James W. Robertson of the Royal Commission on Industrial Training and Technical Education of Canada, and President K. L. Butterfield of the Massachusetts Agricultural College. The Association is to consider some important business in relation to the College.

Final plans have been made for a large dinner to be held in the evening at the Armory, the dinner to be open to all former students of the College and to include the annual banquet of the under-graduates. The dinner and program will occupy the entire evening. The notable speakers of the morning, Mr. Henry Wallace, and others, are on the programme, and will be guests of honor at the dinner.

Positions and Applications

The COUNTRYMAN is seriously considering publishing the various offers of positions which come to the College. Just at this time there are many students, mostly short course students, available for positions as farm managers, farm foremen, and a few as farm hands. The College would be glad to learn of any vacancies for these men. They are also interested at any time to hear from former students who are available for positions.

Back Numbers Desired

We are extremely desirous of obtaining copies of the following numbers of the CORNELL COUNTRYMAN and will be glad to pay for them. December 1903, Vol. 1, No. 1; January 1904, Vol. 1, No. 2; January 1906, Vol. 3, No. 4; March 1906, Vol. 3, No. 6; April 1906, Vol. 3, No. 7; June 1907, Vol. 4, No. 9; October 1909, Vol. 7, No. 1; January 1910, Vol. 7, No. 4; June 1910, Vol. 7, No. 9; January 1911, Vol. 8, No. 4.

High Scholarship

With the rapid growth of the College and the consequent increase in the number of student activities of the College, there comes an irresistible tendency to subordinate one's studies to them. Realizing that a high standard of scholarship is a large factor toward future success, is it not well to consider as we start a new term, to what extent we can enter activities without decreasing our standard of scholarship, and then to limit ourselves to that extent? It is narrow not to enter some activity and endeavor to make good, but remember also, that we are under the deepest of obligations to "make good" in a larger cause, and to prove to the people of New York state that their confidence in us has not been misplaced in furnishing us with the best of instruction and equipment to be had; that we are not

wasting the talents entrusted to our care.

In order to maintain the leadership which we have gained among colleges of agriculture, the standard of scholarship must be kept so high that the graduates who go out into the world will continue to reflect credit upon the institution.

The Tobacco Crop

The severe hail storm which struck the tobacco crop on the last Election Day of the Agricultural Association, completely destroyed the crop together with all the seed, and hereafter there will be no smoking in the Students' Room. For this, the College may well congratulate itself. Because the students are not all smokers was a sufficient reason for voting it down. It typified the capacity of the Agricultural College to stand alone in all things as they do in athletics. Having turned down a beginning, we may look outside the Agricultural College for the second step, and feel sure that a future visit to our College will not reveal a sign:

"SMOKING ROOM"
Ladies Welcome

The members of the College were grieved to learn of the bereavement of three of the members of the faculty. Within the short space of one week Dean Bailey lost his father, Professor Montgomery lost his father, and Professor Tuck his mother.

BOOK REVIEWS

THE TEACHING OF AGRICULTURE IN THE HIGH SCHOOL by Garland Armor Bricker. Published by the MacMillan Company, 66 Fifth Ave., New York City. 184 pages. $1.00 net.

A discussion applying psychological principles to the teaching of high school agriculture and giving illustrations of laboratory exercises. The book reflects the knowledge and enthusiasm of the author in the subject.

THE A B C OF POTATO CULTURE by T. B. Terry and A. I. Root. The A. I. Root Co., Medina, Ohio. $.75 net.

The fourth edition of Terry and Root's treatise on potato culture has just been published. The book treats of soils, manures and fertilizers adapted to potatoes and discusses methods of planting, the best varieties to raise, care of seed, diseases, cultivation, marketing, etc. There are many cuts of efficient machinery, such as planters, weeders, cultivators, sprayers, and diggers, used in the potato industry.

BEGINNINGS IN AGRICULTURE, by Professor Albert Russell Mann of Cornell University, Rural Text Book Series, L. H. Bailey, Editor. Published by the MacMillan Company, 66 Fifth Ave., New York City. 327 pages. Fully illustrated.

This book is founded on the suggestions in the Report of the Committee on Industrial Education in Schools for Rural Communities of the National Educational Association and designed for the purpose of introducing the study of agriculture into the seventh and eighth grades. The most noticeable qualities of the book are its clearness, conciseness and the presence of a nature-study spirit.

FARM AND GARDEN RULE BOOK by L. H. Bailey. Published by the MacMillan Company, 66 Fifth Ave., New York City. 567 pages. $2.00 net.

This book has long been a standard as a Horticulturalists' Rule Book. The name has been changed since it covers a larger field.

CAMPUS NOTES

CALENDAR

February 10th—March 10th

Monday, Feb.	12	Round-Up Club. Lazy Club.
Tuesday, Feb.	13	Association Meeting.
Saturday, Feb.	17	C.E. vs. Ag. (B. B.)
Monday, Feb.	19	Round-Up Club. Farmers' Week begins. Lazy Club.
Monday, Feb.	26	Round-Up Club. Lazy Club.
Monday, Mar.	5	Round-Up Club. Lazy Club.
Thursday, Mar.	7	Monthly Assembly.

* * *

The Governor's Message was the subject of Dean Bailey's talk at the January Assembly. He read the parts concerning conservation and agriculture and spoke in part as follows: "The term 'conservation' was first applied to the forestry problem but has now come to have a wider meaning. Many sections of the country are now participating in this movement. The State of New York has a Conservation Commission whose chairman will speak here Farmer's Week. This college is an instrument of conservation. The Conservation movement has resulted from the idea that the natural resources ought to be handed down unimpaired to our descendants. The policy that the water power of the state shall be for the use of the people and that hydro-electric power shall be sent to every municipality, saving 20,000,000 tons of coal annually, is a wise and constructive one. We make too little use of our streams and go too far afield for our power.

The Commission of Food Supply of New York State, the pure food provisions and the increased powers of inspection are also forward steps. The time is coming when the farmer can solve his own problems but there are some problems which the governments must solve. The Public Service Commission ought to have wider powers. We no longer deny that the government can regulate business. The farmer ought to be benefited by this regulation. The parcels post is a great necessity, for the express companies do not adequately serve him. He should be a free economic agent.

Middlemen are necessary and many of them are honest. But this is no reason why they may not be regulated. If they can be licensed as they sometimes are, why not go a step further. Every state ought to have some department which attends to this regulation and we are gradually coming to it.

The high cost of living is not entirely due to the middleman and perhaps not at all. There are many contributing causes. The consumer, himself, bears an important relation to the cost of living. We live too much from tin cans and small boxes. Our provisions last only from day to day and we live literally from hand to mouth. The result is that the consumer pays for the increased transportation and this is no small item. The architects could render a great service if they would

provide more room for storage. The time is coming when we shall have public storehouses.

There is no one panacea for the high cost of living. Perhaps another contributing factor is that we have lost pride in dirty hands. If we have, we are not grasping the realities of life. There are too many between us and our necessities. It is to be wished that the farmer will not want to get away from his station."

After Dean Bailey's talk some excellent violin selections were given by Miss Cooper.

* * *

The Extension Department has been very active during the past month. It has arranged for about fifteen extension schools lasting from one to two weeks according to arrangement and centralizing the instruction upon subjects suitable to the particular locality. The schools which have been held were at Cherry Creek, Chautauqua County, Alden, Erie County, Wyoming, Wyoming County, Ballston Centre, Saratoga County, Falconer, Chautauqua County, Watertown, Jefferson County, Lowville, Lewis County, Riverhead, Long Island.

The extension work done by the different departments has been as follows: Professor J. E. Rice and L. M. Hurd addressed a meeting at Trumansburg, Professor Rice also addressed one at Hoosic Falls, and L. M. Hurd addressed one at Oaks Corners. A. C. King addressed meetings at Ensenore and Salamanca.

At the show of the Rochester Genesee Valley Poultry Association, the college was represented by Professor J. E. Rice and L. M. Hurd, and at the show of the Jamestown Poultry Association by R. P. Trask.

* * *

Prof. J. H. Comstock of the Department of Entomology addressed a gathering in the parlors of the Unitarian Church during the month. The subject of his address was "Heredity in Animals." Lantern slides were used to illustrate thruout.

This year's meeting of the Breeders' Association held at Washington on Dec. 28, 29, and 30, was one of the most successful ever held by that organization. Drs. Webber, Gilbert and Love of the Plant Breeding Staff and ten of the graduate students of the College were in attendance. Dr. Webber has been Chairman of the Plant Section for some time but retires this year from that position to the more subordinate one of Secretary in order to devote his time to the Associate Editorship of the official organ of the Association—*The American Breeders' Magazine*. Dr. Webber's address to the meeting was entitled "The Effect of Research in Genetics in the Art of Plant Breeding." There were a number of papers read also and the appended list gives those by the Cornell representatives.

Dr. Webber on "The Selection of Corn to Produce Early Maturity."

Dr. Love on "The Relation of Ear Characteristics to Earliness in Corn;" "Comparison of Yield between Hybrids and Selections in Oats."

Dr. Gilbert on the "Report of the Committee on the Teaching of Genetics," and in conjunction with Mr. C. E. Myers, '10, on "Does Hybridization Increase Variability?"

Mr. C. E. Leighty, Assistant in Plant Breeding, on "The Effect of Crowding on the Co-relation of Characters in Oats."

Mr. R. Y. Winters, Assistant in Plant Breeding on the "Inheritance of the Size of Corpuscles in the Pepper Hybrids."

Mr. H. B. Frost, "The Origin of an Early Variety of Matthiola by Mutations."

Mr. H. W. Drinkard, "A Comparison of Pure Lines of Browallia and their left Hybrids."

Mr. R. J. Evans, "Further Studies of the Relation of Temperature to Variations in Pure lines of Stellaria."

* * *

This year during Farmers' Week the Dairy Department intends to hold a prize contest for scoring and judging of butter and cheese open to anyone in New York State.

THE COUNTRYMAN announced last month that the Department of Animal Husbandry had just purchased two very old English books on horse-breeding. Perhaps a few words from the title page will be sufficient to induce more persons to look them up on the shelves of the University Library. The first of these is on

"Horsemanship," by Blundeville (Thomas), in old English wording and profusely illustrated with wood-cuts.

The second is on

"Horses, the Anatomy of," by Andrew Snape, Junior Farrier to his Majesty. This book contains an exact and full description of the frame, situation and connection of all his parts (with their action and uses.)

* * *

The Nut Growers Meeting held at the Agricultural College, December 14 and 15 was very successful. Interesting and instructive papers were read by T. P. Littlepage, a lawyer of Washington and Prof. E. L. Lake and C. A. Reed of the United States Department of Agriculture.

* * *

Prof. Livermore, of the Department of Farm Management, was at Washington, D. C., a short time ago to present the results of the Agricultural Survey Work of the Department to the members of the office of Farm Management of the United States Department of Agriculture.

* * *

Prof. Warren is scheduled for addresses on Farm Management at Farmers' Week meetings at Guelph, Ontario; Springfield, Ohio; Morrisville, New York; and at Pennsylvania State College. He will also speak before the New York State Agricultural Society, and the New Jersey State Agricultural Society.

* * *

The Department of Plant Pathology in co-operation with the Department of Farm Mechanics, gave an exhibit at Rochester. The Cornell Spray Tower developed in one of the field laboratories of the Department of Plant Pathology, demonstrated spraying in the wind.

* * *

The American Society of Agricultural Engineers met at St. Paul on December 25 and held a two days' meeting. Howard W. Riley of the Department of Farm Mechanics, was elected president for the coming year. This society which has a membership of 62, includes most of the teachers of Farm Mechanics, Farm Engineering, and Rural Architecture, in the United States, and also many representatives of firms manufacturing agricultural machinery. During the four years the society has been established, it has held five meetings, conducted one or two public competitions of machinery, and has published its proceedings every year—in fact, a very promising future is predicted for it.

* * *

The Homemakers' Conference is conducted by the Home Economics Department during Farmers' Week. Lectures and exhibition of work are presented throughout the week upon subjects pertaining to home life. This year lectures will be given by Miss Rose upon food and nutrition, by Miss Van Rensselaer upon household management and sanitation, by Mrs. Young upon house furnishing and decorating, by Mrs. Harrington upon equipment and household management, by Mrs. Watson, of Alfred, upon principles of dyeing, by Professor Howard Riley upon sewage disposal, household mechanical contrivances and plumbing.

Mrs. O. S. Morgan, who was in attendance upon Farmers' Week last year and who furnished musical entertainment throughout the week, will be present and speak upon music for rural communities. Her work will be illustrated by song.

The Homemakers' Conference is officered by women of the state.

One day during Farmers' Week will be of special interest to Winter Course students of previous years. The session will be in charge of the Winter Course students of 1911–12. It is

hoped that many of the former Home Economics Winter Course students will be present.

* * *

The following officers of the Craig Club have been elected. President, Richard L. Meyers; vice-president, Ellwood Douglass; secretary, Miss Beulah Dayton; treasurer, Michall Joseph. The program committee appointed are Miss Mary M. Jones, Walter Peterson, and Ralph Westlake. The work of these officers and this committee together with co-operation of the members of the club make the Craig Club, one of the most successful clubs ever organized in the College of Agriculture. The meetings are full of enthusiasm, and the topics discussed are close to the fundamentals of life rather than of agriculture. Miss Yates' talk on University Education verus Home Culture will long be remembered. At all the meetings there is good music and refreshments. The Craig Club basketball team defeated the General Agricultural team by a score of 13–10.

* * *

The Department of Plant Breeding has sent a large exhibit to the Lincoln Agricultural School at Lincolndale, N. Y., to be used as an object lesson for the boys of this school. Most of the 200 students of this institution were waifs picked up on the streets of New York. They are taught the rudiments of agriculture and are given actual experience in the care and management of cattle, horses, poultry, etc. When they are 14 to 16 years of age, they are recommended for work on the farm. The farmers find the work of these trained boys of great value and the majority of them develop into useful citizens.

* * *

The Reunion and Dinner of the Synapsis Club was held in conjunction with the Association Meeting at which fifteen old members of the Club were present, besides guests from five or six different states. The yells of Illinois, Kansas and Cornell mingled. Everyone reports an extremely pleasant affair.

During the month, Mr. A. C. King spoke at Truxton, Little York, Preble, and several times each in Courtland, Tompkins and Yates counties and Mr. Gott addressed several meetings in the western part of the State.

* * *

The Agricultural Association elections for the second term were held on January 16. This was the first time that the new method of election has been used. In all, three hundred and thirty-four votes were cast. F. E. Rogers, Sp., was elected president; C. W. Whitney, '13, vice-president; Miss D. Baker, '12, secretary; and W. R. Wilson, '12, treasurer. H. Embleton was elected to the executive committee.

* * *

The Sophomore Agricultural class held a meeting January 15th. After a short business meeting, Professor A. R. Mann gave a very stimulating talk on, "Student Activities."

* * *

The following have been chosen to compete in the annual Eastman stage, held Farmers' Week: W. H. Hook, '12, M. B. Goff, '13, C. W. Whitney, '13, W. H. Bronson, '14, F. E. Rogers, Sp., and M. C. Kilpatrick, Sp.

* * *

The Agricultural class of 1914 gave a dance in the Sage Gymnasium, on the evening of January 19. It was well attended and all present spent a very enjoyable evening.

* * *

Professor E. G. Montgomery formerly Professor of Field Crops at the University of Nebraska, will fill the vacancy in the Department of Farm Crops. Professor Montgomery graduated from the Nebraska Agricultural College with the class of 1906, and for the past five years has been engaged in experimental work in Field Crops at that institution.

* * *

It is interesting to note, from the last issue of the *Announcer*, that at present there are between seventy-five and one hundred experiments being carried on in this College by the various departments.

FORMER STUDENTS

GEORGE WENDELL BUSH.

'05, B. S. A.—George Wendell Bush was born on a farm at Berkshire, N. Y. After graduation from the Newark Valley High School in 1901, he entered Cornell and was graduated in June, 1905.

He then accepted a position as a foreman on E. H. Harriman's large estate at Arden, Orange Co., N. Y. Soon afterwards he was made manager of the farms. Later he also became connected with the Arden Farms' Dairy Co. of which the Harrimans are the principal owners, in conjunction with Edwin K. Beekman, the veteran New Jersey fruit grower. Mr. Bush is now a director of this company and deputy to Mrs. Harriman in the company.

Since 1906, Mr. Bush has drained and brought into cultivation several hundred acres of what was formerly the most worthless swamp. This reclaimed area is now used for both meadow and garden land. The meadow portion is now producing from three to four tons per acre of the highest quality hay. On a portion of the black muck soil reclaimed, over 1100 barrels of onions, besides several hundred barrels of other vegetables, were grown during the last season. And all this now fertile land was, five years ago, a dense thicket of bogs and underbrush.

Five small and old orchards have been pruned, cultivated, sprayed and fertilized, until, instead of a few scattering knotty apples, they have produced during the past three seasons an average of 800 barrels, these selling as high as $3.50 per bbl. for export.

Alfalfa has been brought into the farm rotation until a considerable area is now producing six tons per acre at four cuttings. Clover and soy beans have found their way into the rotation as cover crops, the returns from these now reaching well up into the hundreds of dollars.

In conjunction with the Arden Farms' Dairy Co., there has been developed a herd of about one hundred head of pure bred Holstein Friesians besides the regular grade herd of four hundred cows, which are bred only to pure bred sires. The Sharpless milking machines have been installed and an effort is being made to produce milk with the maximum bacterial count as low as 10,000 to the cu. cm., by keeping the milk away from outside air at all times.

One of the most important things of interest in connection with the management of this large property is that it is operated so as to show a good percentage income on the capital invested.

As was reported in a recent number of the COUNTRYMAN, Mr. Bush was married last August to Miss Meta Elizabeth Smith, at Oseo Lodge, Monroe, N. Y.

'91, B. S. A., '98, M. S. A.—Horace Atwood who is assistant agriculturist at the West Virginia Experiment Station, Morgantown, W. Va., is the author of a recently published station bulletin entitled "West Virginia as a Poultry State." The bulletin points out some of the manifest advantages of West Virginia from the standpoint of the poultryman, besides containing much on the subject of poultry raising.

'96, B. S. A.—Joseph C. Blair was here recently inspecting the buildings and work of the College of Agriculture. He was especially interested in the development of Rural Art. Mr. Blair is Professor of Pomology and chief in Horticulture in the College of Agriculture and Experiment Station of the University of Illinois, at Urbana, Ill.

'98, M. S. A.—James E. Higgins is Horticulturist at the Hawaii Experiment Station, Honolulu, H. I.

'03, B. S. A.—Herbert A. Hopper is managing his farm on West Hill, Ithaca. This winter he is also employed as an instructor in Extension Teaching at the extension schools held at various places through the state.

'04, A. B., '05, M. S. A.—R. S. Woglum is a special agent of the Bureau of Entomology at Washington.

'05, B. S. A.—J. M. Swain, formerly professor of Entomology at McDonald College, St. Anne, Canada, has accepted a position as assistant entomologist for the Dominion Government at Ottawa.

'06, B. S. A.—P. L. Lyford is a forest engineer and his address is 206 Board of Trade, Montreal, Canada.

'06, B. S. A.—Charles W. Mann, who is with the U. S. Bureau of Plant Industry, visited here during the holidays. He is conducting special investigations concerning the transportation and storage of grapes, apples, and citrous fruits. Mr. Mann spent most of last year in California.

'06, B. S. A.—Charles F. Shaw is assistant professor of agronomy in the Pennsylvania State College.

'07, B. S. A.—John Goldhaar is teaching manual training in the public schools of New York City. His address is 1075 Kelly Street, Bronx, New York City.

'07, W. D.—C. A. Thornton is now manager of a certified milk farm owned by John H. Baker at East Aurora, N. Y.

'08, B. S. A.—Mr. Chester Jermain Hunn is well known to all who came to Ithaca prior to his graduation. They and those who have come since that time and have there met his worthy father, Mr. C. E. Hunn, will know where "Chet" first caught his inspiration for horticultural work. After matriculation from the Ithaca High School, he entered the freshman class in the College of Agriculture and was graduated in 1908. Before graduation there came an offer of a position in the Horticultural Department of the Hawaii Experiment Station in Honolulu and having completed more than the required number of hours for his degree, he accepted the offer and went to his new field of labor in the winter of 1908. This work has given him an excellent opportunity for studying tropical plants and particularly the fruits of the tropics. He has devised very complete outlines for the systematic study of the varieties of some of these fruits. In November, he made an extended trip on Hawaii, the largest island of the Hawaiian group, to investigate the conditions of avocado growing and search for rare or off-season varieties of this fruit now springing into so much promise.

Not only has Hunn been in horticultural work but he has served as the very active and efficient Secretary-Treasurer of the Cornell Club of Hawaii.

Mr. Hunn was the unfortunate victim of an attack of typhoid fever in the latter part of the summer but his friends will be gratified to know that his robust constitution and good care brought him safely to health and he is now adding daily to his avoirdupois.

'08, B. S. A.—John Vincent Jacoby, of Reservoir Avenue, Ithaca, visited in Ithaca the latter part of last week. During the past year he has been on a fruit farm at Middleport, N. Y. He is now to enter the employ of the Niagara Sprayer Company at Middleport, and in the spring is to manage a small farm at Lockport for one of the officials of the Niagara Sprayer Company.

'08, W. P.—W. P. Lippincott, has resigned as assistant professor of poul-

try, Iowa State Agricultural College to accept a similar position at Kansas State Agricultural College.

'08, W. P.—Allen G. Philips was married on Saturday, April 1st, at West LaFayette, Ind., to Grace Hooper Woodward.

'09, B. S. A.—Miller A. Travis recently resigned his position as superintendent of the Beechwood Dairy at Irvington-on-the-Hudson to take a position as Bacteriologist and Inspector for the Detroit Creamery Co., at Detroit, Michigan.

'09, B. S. A.—E. H. Thompson, scientific assistant in the Office of Farm Management, U. S. Dept. of Agriculture, visited on the Campus recently.

'09, B. S. A.—G. N. Wolcott, who is with the U. S. Bureau of Entomology, has been studying the boll-weevil at Dallas, Texas. His work has been so successful that Dr. L. P. DeBussy of Summatra, Dutch East Indies, has asked permission of the Bureau of Entomology to allow Mr. Wolcott to visit the West Indies to collect parasites and pernicious insects to be shipped to Dr. DeBussey for use in experimental work.

M.S.A.,'10.—M. C. Burritt, editor of the *New York Tribune Farmer* visited on the Campus recently.

'10, Ph. D.—E. P. Humbert recently accepted the position of Agronomist at the New Mexico Agricultural College and Experiment Station.

'10, B. S. A.—Ralph E. Wadsworth & Co., have established a commercial florist business at Northboro, Mass. They have one greenhouse completed and intend to have 75,000 square feet under glass. They are going into the wholesale growing of cut flowers.

'10, W. H.; Michigan, A. B.—Geo. H. Sprague visited Ithaca on January 6th. He is foreman of the fruit department of the T. D. Rice estate at Turner Hill Farm, Ipswich, Mass. There are about 100 acres of orchards under his management.

'07–'10, Prof.—Mr. and Mrs. Garrett S. Collier of Kinderhook, N. Y., announce the engagement of their daughter, Maud Bain to Mr. L. B. Judson. Mr. Judson gave up his position here as Assistant Professor of Horticulture to assume the management of his fruit farm near Kinderhook.

'10, W. A.—Wm. Hotailing is managing the Hillcrest Farms, near Binghamton, N. Y.

'10, W. A., '11, W. H.—Carl F. Juengling is plantation manager for the Colombo Tropical Fruit Company of Buffalo, N. Y. Their plantation is located at Vega Baja, Porto Rico, and citrus fruits and pineapples are the principal crops grown.

'11, B. S. A.—Floyd W. Bell is taking advanced work in animal husbandry at Ohio State University. He visited at the college here recently.

'11, B. S. A.—F. E. Benedict is advertising representative of the *American Poultry Journal*, Chicago, and is traveling in the middle west. He was married on August 26 at the Court Street Church in Columbus, O., to Miss Viola E. Albright, daughter of Mrs. Minnie Albright of Ithaca.

'11, B. S. A.—John E. Dougherty was married on Saturday, Dec. 23d, at West New Brighton, N. Y., to Miss Ada Richmal Heap.

'11, W. D.—W. R. Bardon is manager of a certified milk plant owned by the Detroit Creamery Co., just out of Detroit, Mich.

'12 Ex.—Douglas G. Woolf, who is away on a leave of absence, is occupying the position of head chemist in the Waldrich Bleachery at Delawanna, N. J. He is also teaching Chemistry in night school at Montclair, N. J. He expects to return next fall to complete his course, and we hope, to reassume his duties on the COUNTRYMAN. His address is 150 Claremont Ave., Montclair, N. J.

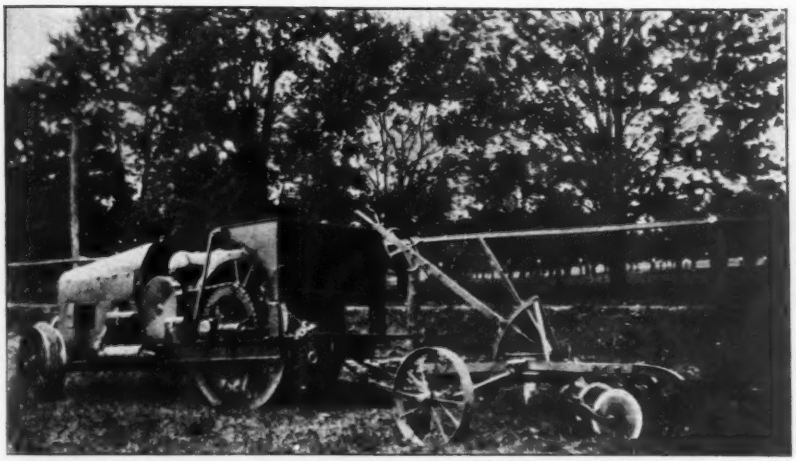
(Former students: You like to hear from your former college friends, do you not? They are just as interested in hearing from you. Will you send us a few lines so that we can let your friends know where you are and what you are doing?

GENERAL AGRICULTURAL NEWS

A GASOLINE TRACTOR

A gasoline tractor which promises to be of practical value to orchardists is shown herewith. The tractor is built low enough to work under trees in an orchard and is designed as a one-man machine. The motor is a 35 horsepower two cycle gasoline engine of marine type.

The accompanying illustration shows the tractor as it appeared in a demonstration on the farm of the Willard State Hospital at Willard, last summer. The tractor was used in pulling a three gang plow on a rather stiff clay soil.



NEW 35-HORSEPOWER GASOLINE TRACTOR AND PLOW ON WILLARD FARM NEAR OVID, N. Y.

* * *

WESTERN FARMERS MOVING EAST

Commissioner Pearson of the State Department of Agriculture reports a general migration of Western farmers to New York abandoned farms. The New York exhibit at the American Land and Irrigation Show justified this migration. It has been proven that the so-called abandoned farms in this state can be turned into splendid profit producers if properly managed.

COUNTY FAIR STATISTICS

The Federal Department of Agriculture in connection with the Farmers' Institutes conducted 71 instruction trains covering over 40,000 miles during the last year, and has also collected and published information respecting the organization and conduct of county fairs. Over 12,000 fair associations are in operation in the several states, representing a membership of over 246,000. In 1909 the gross income was about six and one-half millions of dollars, and the amount paid in premiums over two and one-half millions. The attendance that year was between fifteen and sixteen millions.

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STANDARD OF LEGAL MILK

Dr. L. L. Van Slyke who addressed the last Milk Problem Conference in New York supported the retention of the present Standard of Legal Milk, the composition of which the law says shall contain: 3% of fat and 12% solids. A lower standard would be detrimental, because it would give an opportunity for adulteration, as by

the addition of water, skimmed milk or other substances, and because milk of a lower percentage of solids would be of much less value to the consumer.

The time is near when milk will be sold under a guarantee of percentage of fats and solids. This will encourage the sale of milk on the basis of value, encourage production of richer milk, and tend to promote the knowledge of milk composition.

* * *

PARAFFINING CHEESE

Bulletin 181, of the Bureau of Animal Industry, of the U. S. Department of Agriculture, entitled "Methods and Results of Paraffining Cheese," has recently been issued. Although this practice has been in use only a few years, nearly all cheese of the Cheddar type made in the United States is paraffined before it reaches the consumer. The method employed is to immerse the cheese in a paraffin bath at 220°F for 2 to 10 seconds. This process improves the appearance of the cheese, prevents, to a great extent, loss by evaporation, and inhibits growth of mold.

* * *

SCARCITY OF HORSES FOR ARMY USE

In late years there has been considerable difficulty in obtaining suitable horses for the United States Army, and the supply seems to be steadily diminishing. As an aid to supplying horses of this kind, an appropriation was made by Congress whereby stallions should be furnished free to horse-owners in suitable localities, in return for which the government has an option at a fair price on the foals at a certain age. This plan is being tried in Virginia and is progressing successfully.

* * *

57TH MEETING OF THE WESTERN NEW YORK HORTICULTURAL SOCIETY

The annual meeting of the Western New York Horticultural Society was held in Convention Hall at Rochester, Jan. 24–26. The fruit display and the show of apparatus occupied the space of the hall, annex and basement. Prominent space was taken by exhibits of the Geneva Experiment Station and of the College of Agriculture. A large number of students and faculty members of the college attended the meeting. The judging of exhibited fruit was done by students from the class in Advanced Pomology.

There were a large number of addresses by prominent authorities and practical fruit-growers on all phases of the fruit industry.

* * *

DAIRYMEN MEET AT OLEAN

The annual convention of the New York State Dairymen's Association was held at Olean, N. Y., December 12–13. Addresses were made by Dr. H. J. Webber on breeding; coöperative tests, by Helmer Rabild; animal nutrition, by Dr. W. H. Jordan; milk in the diet, by Prof. Flora Rose; certified milk, by W. E. Miller; and market defects in butter, by C. W. Fryhofer, dairy expert at New York. Resolutions were passed denouncing the adulteration of dairy products in any manner whatever; recommending that the use of the word "Butterine," as used by oleomargarine makers, be made unlawful; against the proposed Canadian reciprocity act; and endorsing the work of cow-testing associations.

* * *

THE PROPOSED MCKINLEY BILL

Effort has taken concrete form, looking toward enlarged appropriations at Washington in the interest of the agricultural colleges. A bill was introduced last summer by Representative McKinley, and is to appear this winter with modifications, the latter approved by the Illinois state farmers' institute, the state board of agriculture, national grain dealers' association and by other agricultural and commercial organizations.

The McKinley bill is outlined in brief herewith; it is proposed that congress pass a law providing for an annual appropriation of a sum equal to one mill for each acre of farm land in each state for the year ending June

30, 1913; an annual increase of one mill each year for nine years along this line. This will mean that at the tenth year this increased appropriation shall be the equivalent of one cent for every acre of farm land in the respective states.

The amended McKinley bill provides that the sums appropriated to the several states are to be used solely to employ and send out successful farmers and practical field demonstrators, properly instructed and qualified. These are to travel over the state, or the certain sections thereof, to which they are respectively apportioned, teaching, encouraging and helping farmers and land owners to adopt and put into regular practice the improved and scientific methods of agriculture as discovered and practiced by the various land-grant colleges.

* * *

NATIONAL IRRIGATION CONGRESS

The scope of the 19th National Irrigation Congress which convened in Chicago, December 5th, continuing four days, was much broader than ever before. While heretofore a great many of the congresses have devoted all of their attentions to irrigation matters pure and simple, this congress in addition gave much consideration to matters of drainage. When it is recalled that there are millions of acres in the so-called humid region now unproductive because of the inability to get rid of excessive moisture, the importance of this innovation is apparent.

The eastern part of the United States has felt that the irrigation congress has to do only with the far west, while, as a matter of fact, the last congress, at least, considered the middle western and eastern problems, as well as those west of the Mississippi river.

* * *

SOME ANSWERS TO AN EXAMINATION GIVEN BY A N. Y. STATE CITY BOARD OF HEALTH FOR THE POSITION OF MILK INSPECTOR.

Question.

(a) Name the constituents in milk.

(b) Give the percentage of each in normal milk.

Answer.

(a) Fat, albumen, ash, bacteria.

(b) Fat should at least contain from three to four per cent.

Albumen should not contain any more than five per cent. and no less than three per cent.

Ash will not contain any more than five per cent. if the milk is said to be pure and clean.

Bacteria will contain from 75 to 85 per cent.

Question

(a) Define pasteurization.

(b) Name the advantages and disadvantages of pasteurization.

Answer.

(a) Pasteurization is a field of grass where a cow may be turned out to get the fresh air, its eating for the day, and its necessary rest.

(b) The advantages derived are that a cow getting plenty of grass, the necessary rest and water it will produce wholesome milk, that is it will contain all the parts and come up to market requirements.

The disadvantages are that a cow while out in pasture will wander away and probably enter a garden where onions and the like are raised and possibly eat some of the onions and in that way the milk would not come up to the standard, that is it would have that onion taste. Another disadvantage is that a cow laying down in a field is apt to lay on some stones and hurt the udder which is dangerous.

* * *

BOVINE TUBERCULOSIS

Farmer's Bulletin 473, soon to be issued by Secretary Wilson of the United States Department of Agriculture, contains an important and most comprehensive statement of facts on bovine tuberculosis. The bulletin deals with the history, nature, symptoms of the disease; how it spreads, how a herd is infected, the tuberculin test, and the prevention and suppression of the diseases.

NEW YORK STATE FRUIT GROWERS' ASSOCIATION

(*Continued from page 156*)

for the most part to the subject of spraying. Professor H. H. Whetzel spoke on the Baldwin spot which is a physiological disease and should not be confused with the stippen which can be controlled by spraying. Professor Donald Reddick spoke on the winter injury and told how to determine the minimum night's temperature as early as eight o'clock. Professor G. W. Herrick and Professor P. J. Parrott of the Geneva Station discussed the insect pests of the past season. In the evening session Professor M. A. Blake of New Jersey discussed the subject of peaches very comprehensively.

In the Thursday morning session State senator H. M. Dunlap of Illinois spoke on some of the factors in successful apple growing. He advocated the use of the tractor. Lloyd S. Tenney gave a very interesting and instructive address on success and failure in coöperation and recommended that the town of Hilton start a coöperative association. That this address has already borne fruit was evidenced by the great interest expressed in coöperation throughout the meeting. In the afternoon, Mrs. Dunlap, the senator's wife, spoke on a balanced ration for man, and recommended that domestic science be taught more widely to the girls of the country.

The banquet, held Thursday evening, was one of the main events of the convention. It was also the largest banquet ever held under the auspices of the Association, there being eight hundred and sixty present. After a very satisfying menu, Dr. W. H. Jordan, of the Geneva Station, as toastmaster introduced the following speakers: Honorable Charles E. Ogden of Rochester, who spoke on the relation of that city to the surrounding country; State senator H. M. Dunlap of Illinois; Reverend T. Maxwell Morrison, who spoke on the social environment of the farm; Professor M. A. Blake of New Jersey, who said a few words on the value of fruit exhibitions; Mrs. Dunlap, the senator's wife; Charles K. Scoon of Geneva and Commissioner Raymond A. Pearson, who spoke on the closer relationship between the producer and the consumer, thus closing a very enjoyable evening.

Friday morning Commissioner Pearson spoke on what the west had taught us regarding the successful marketing of fruit. The fruit growers should let the consumers know that New York can produce good fruit, and then, having once gained a reputation, live up to it. Professor U. P. Hedrick of the Geneva Station then spoke on "pedigreed" fruit trees, pro and con. In the afternoon Dr. Frank H. Lattin of Albion spoke on his experiences in renovating old orchards in Orleans and Oswego counties. Dr. Lattin has had great success along these lines under peculiarly adverse conditions.

Besides the regular speakers on the program, a no less instructive feature was the question box, and discussions where one could hear practical fruit growers give their opinions on subjects of interest to them. Everyone that attended the meeting received inspiration to give his orchard better care, drainage and tillage, and above all to give the consumer a square deal and an honest pack.

The officers elected for the current year are: President, Clark Allis of Medina, re-elected; first vice-president, A. C. King of Trumansburg; second vice, Luther Collamer of Hilton; third, G. W. Miller of Byron; fourth, George S. Clarke of Milton; secretary-treasurer, E. C. Gillett of Penn Yan, re-elected. The executive committee was re-elected.

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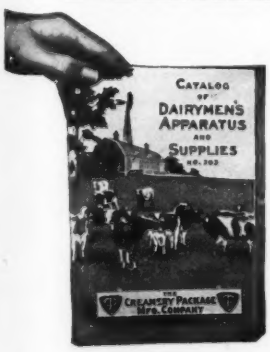

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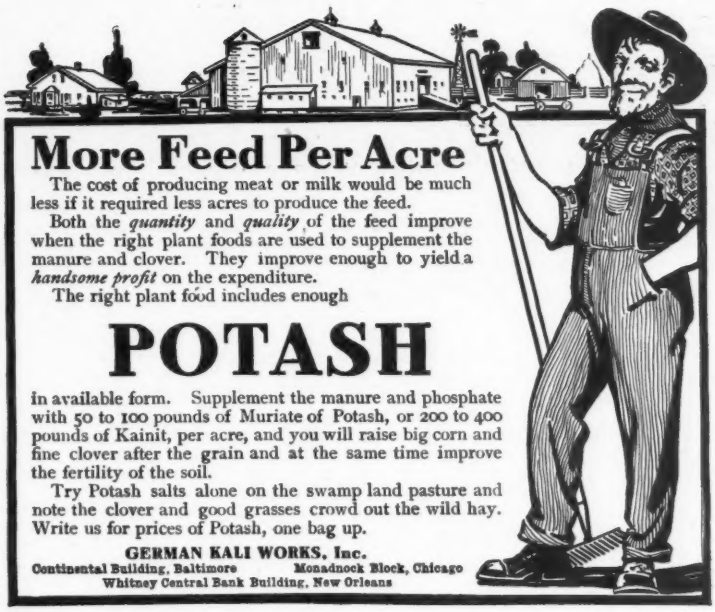

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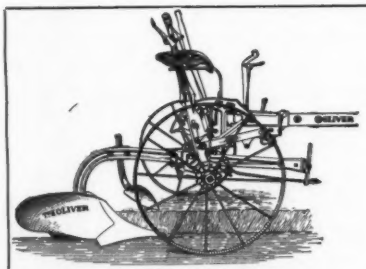

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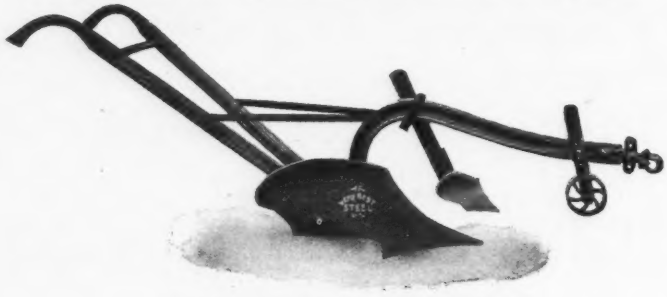

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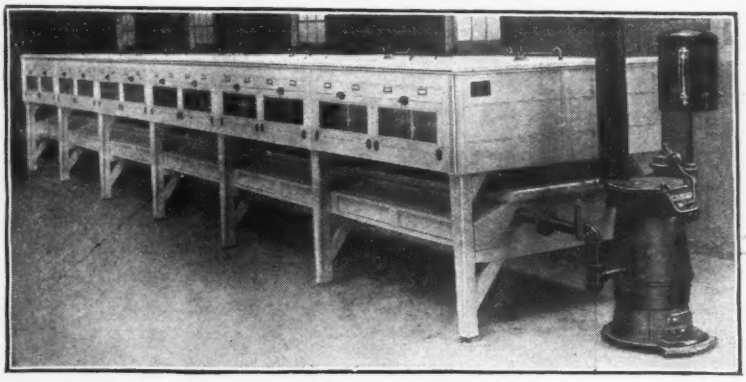

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The U. S. **Interlocking** Cream Separator represents the **highest attainment** in cream separator construction and possesses **every essential separator requirement** in the highest known degree.

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